AVAILABLE: Library of Congress (QC794.A38)

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TABLE OF CONTENTS:

BELYAYEV, S.T.

21(7) PHASE I BOOK EXPLOITATION SOV/1243

Akademiya nauk SSSR. Institut atomnoy energii

Fizika plazmy i problema upravlyayemykh termoyadernykh reaktsiy, t. III. (Plasma Physics and the Problem of Controlled Thermonuclear Reactions, v. 3) [Moscow] Izd-vo AN SSSR, 1958. 362 p. 3,000 copies printed.

Resp. Ed.: Leontovich, M.A., Academician.

PURPOSE: This collection contains previously unpublished work of members of the Institut atomnoy energii (Institute of Atomic Energy) of the Academy of Sciences of the USSR. It is intended for scientists interested in this field.

COVERAGE: This book is the third of four volumes of previously unpublished work of the members of the Institute of Atomic Energy during the period 1951-58. The exploitation cards on the other volumes in this series have been released under the numbers 1241, 1242, and 1244.

Card 1/6

BELYAYEV, S. T.

"Field Theoretical Method for Collective Excitations in Fermi Systems."

report presented at the Intl. Conference on Many-Body Problems, Utrecht, 13-18 June 1960.

BELYAYEV S.T.

BUDKER, G. I. and BELYEV, S. T.

"Kinetic Equation for an Electron Gas for Rare Collisions." (Work - 1954); pp. 330-354.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." Vol. II. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR.
resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

BELYAYEV S. T.

BELYEV, S. T. and BUDKER, G. I.

"Relativistic Plasma in Variable Fields," (Work - 1953); pp. 283-329.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions:" Vol. II. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR, resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204600028-6

BELYAYEV S.T.

BELYEV, S. T.

"Kinetic Equations for Dilute Gases in Strong Fields." (work carried out in 1955); pp. 50-65.

"The Kinetics of an Ionized Gas in a Strong Magnetic Field." (Work carried out in 1955); pp. 66-85.

The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." Vol. III. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR.
resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

BELYAYEV S. T.

BELYEV, S. T. and BUDKER, G. I.

"Multi-Quanta Recombination in an Ionized Gas." (Work carried out in 1955) pp. 41-49.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." Vol. III. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR.
resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

approximation investigated here the following mainly holds: 1) The interaction between the particles is not described by a potential but by the exact amplitude of scattering, which permits the investigation of strong interactions. After the substitution of the potential by the amplitude there remains the possibility to develop a perturbation theory in relation to the amplitude. 2) Not the energy of the quasiparticles (i. e. the denominator of the Kernel) is expanded into a series but the effective potentials of interaction Σ_{ik} and the chemical potential μ. The connection of the Kernel with Σ_{ik} and μ is determined exactly. The energy $\varepsilon_{\vec{p}}$ of the elementary excitations (quasi-particles) in relation to the amplitude f is possible only with high excitations, the states of the system situated close to the ground can, however, in principle not be obtained by means of the perturbation theory. There are 4 figures and 5 references, 3 of which are Slavic.

ASSOCIATION: AS USSR (Akademiya nauk SSSR)

SUBMITTED: August 2, 1957

AVAILABLE: Library of Congress

Card 2/2 1. Base particles-Energy-Spectrum analysis

AUTHOR: Belyayev, S. T. 56-2-22/51

TITLE: The Energy Spectrum of a Non-Ideal Bose Gas (Energeticheskiy spektr neideal'nogo Boze-gaza)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol 34, Nr 2, pp 433-446 (USSR)

ABSTRACT: The present work determines the one particle Kernel for a system of interacting Bose particles. By means of this Kernel the energy spectrum of the excitations (quasiparticles) as well as the energy of the ground state and the distribution of the particles in this state on momentum are computed. First the graphs corresponding to the effective potentials are estimated. Every loop with more than two composed lines introduces a small parameter β while the loops with two composed lines do not contain this β. The next chapters deal with an equation for the effective potential Γ, a Kernel of first approximation, the second approximation for the Kernel, the spectrum of the quasiparticles, the energy of the ground state, the possibility of higher approximation, the high excitations ($pf_0 \sim 1$) and the case of elastic spheres. For the

Card 1/2

The Application of Quantum Field Theory Methods on a System of Bose Particles 56-2-21/51

Bogolyubov (reference 5). A mathematical suffix offers the proof for a theorem. There are 5 figures and 9 references, 5 of which are Slavic.

ASSOCIATION: AS USSR (Akademiya nauk SSSR)

SUBMITTED: August 2, 1957

AVAILABLE: Library of Congress

1. Base particles-Theory

Card 3/3

of Dayson's equation in electrodynamics). For the determination of Σ_{ik} and μ a certain approximation is needed. The present work calculates the magnitudes in the approximation of small density. The author begins with the formation of the problem as well as with the investigation of the Feynman-graph. A system of N spin-less Bose--particles are investigated with the mass m = 1, which are enclosed in the volume V. $N,V \to \infty$, but $N/V = n$ is supposed to be finite. The Hamiltonian of the system is also put down in detail. The next chapter deals with the Kernel for the condensate: all of them deteriorate to single factors each of which depends on time argument only. The one-particle condensate function is them closer investigated. The following chapters of this work deal with some characteristics of the condensate, the Kernel for a particle with $\vec{p} \neq 0$, the connection of the Kernel with the parameters of the system and the approximation of the perturbation theory for Σ_{ik} and μ. The expression obtained at the end of this work for the energy of the quasi particles and for the mean occupation numbers in the ground state coincide with the results of a well-known work of

AUTHOR: Belyayev, S. T. 56-2-21/51

TITLE: The Application of Quantum Field Theory Methods on a System of Bose Particles (Primeneniye metodov kvantovoy teorii polya k sisteme Boze-chastits)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol 34, Nr 2, pp 417-432 (USSR)

ABSTRACT: The present work develops further the method of the Kernel for a system of particles consisting of a great number N of interacting particles. This system has the following characteristic feature: In the ground state there is a great group of particles with the momentum $\vec{p} = 0$ (condensate), which forbids the use of the usual technique of quantum field theory. But with a great N the usual technique of the Feynman-graph can be used for the particles with $\vec{p} \neq 0$ and the condensate (which does not disappear at the beginning of interaction) can be regarded as a certain external field. The Kernel is expressed by three effective potentials Σ_{ik} (emission and absorption of a pair, and scattering) as well as by the chemical potential μ of the system (analogon

Card 1/3

BELYAYEV, S.T., ADIASEVICH, B.P., POLUNIN, Yu.P., ZAVOYSKIY, Ye.K.

"Sources of Polarized Particles."

paper submitted at the All-Union Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 November 1957.

Category : USSR/Atomic and Molecular Physics - Statistical Physics
Thermodynamics D-3

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3435

for the function F for a system of non-interacting particles in an electromagnetic field and for the case of a Coulomb interaction between particles. The latter case is considered under the condition that the particle energy $E \ll \sqrt{137\ L}\ mc^2$, where L is the Coulomb logarithm. The above equation leads to a relativistic equation for the ordinary function f, but not in a relativistically-invariant form. The authors also consider the problem of the energy transfer and momentum transfer from one gas to another.

Card : 2/2

BELYAYEV, S.T.

Category : USSR/Atomic and Molecular Physics - Statistical Physics Thermodynamics D-3

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3435

Author : Belyaev, S.T., Budker, G.I.
Title : The Relativistic Kinetic Equation

Orig Pub : Dokl. AN SSSR, 1956, 107, No 6, 807-810

Abstract : The authors consider the problem of the relativistic invariance of the formulation of the kinetic equation and of the transformation properties of the distribution function. A vector F_k is introduced, which depends on the four coordinates x_k and on the four momenta p_k in such a manner that $\int F_k d^4p = j_k \quad (k = 1, 2, 3, 4)$

where j_k is the usual four-vector of the particle flux and density. F_k satisfies the relationship $F_k = Fu_k$, where u_k is the four-velocity of the particle, and $F(x,p)$ is called the scalar of the distribution function. If the rest masses of the particles are equal, then $F(x,p)$ is related simply to the scalar $f(x,p)$, which coincides with the usual distribution function. A relativistically invariant equation is obtained

Card : 1/2

Yugoslavia/Physical Chemistry. Atom. B-3

БЕЛЯЕВ, С.

Abs Jour : Referat Zhur - Khimiya, No 7, 1957, 21930

Author : Belyayev, S.
Inst : None
Title : Graphic presentation of magnetic moments of atoms

Orig Pub : Glasnik Khem. Drushtva, 1956, 21, No 1, 1-8
(published in Serbo-Croatian with a German summary)

Abstract : Total magnetic moment of an atom g $\sqrt{I(I+1)}$ can be graphically presented by g times elongated hypotenuse of a triangle with I and $\sqrt{I}$ for legs. This does not contribute anything new to the study of magnetic properties of atoms but gives a geometrical presentation of magnetic moments participating in formation of electron surfaces.

Card 1/1

-4-

BELYAYEV, S.S.; GEMPEL', A.R.

Improving the cutting disks for cutting joiner's pins. Suggested by S.S.Beliaiev, A.R.Gempel'. Rats.i izobr.predl.v stroi. no.13:115 '59. (MIRA 13:6)

1. Derevoobdelochnyy zavod No.1 tresta Stroydetal' 82 Glavleningradstroya.
(Woodworking machinery)

BELYAYEV, S.N.

Effect of the time of slide valve switching on the slider motion of a hydraulic press with storage battery. Kuz.-shtam. proizv. 4 no.1:22-25 Ja '62. (MIRA 17:3)

YEZZHEV, A.S.; SKLADCHIKOV, Ye.N.; BELYAYEV, S.N.

Automatic presses for the tabletting of AG-4C molding materials.
Kuz.-shtam.proizv. 5 no.2:31-35 F '63. (MIRA 16:2)
(Plastics machinery)

BELYAYEV, S.N., inzh.

Liquid pressure fluctuations in the working cylinder of a hydraulic-screw hammer press. Trudy MVTU no.111:90-98 '64. (MIRA 17:9)

BELYAYEV, S.N., inzh; BOCHAROV, Yu.A., kand.tekhn.nauk,dotsent

Floating level regulator for a hydropneumatic microaccumulator.
Trudy MVTU no.111:83-89 '64. (MIRA 17:9)

BELYAYEV, S.N.

Simplifying the calculation of crosspiece travel for battery-driven hydraulic presses. Kuz.shtam. proizv. 3 no.1:28-30 Ja '61. (MIRA 14:1)

(Hydraulic presses)

BELYAYEV, S. N.

SOV/137-58-8-16937

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 102 (USSR)

AUTHOR: Belyayev, S.N.

TITLE: ~~Production of~~ Individual Thin-sheet Piece Blanks of Wedge-shaped Cross Section by a Rolling Process (Polucheniye tonkolistovykh shtuchnykh zagotovok klinovidnogo secheniya metodom val'tsovki)

PERIODICAL: V sb.: Mashiny i tekhnol. obrabotki metallov davleniyem. (MVTU, 79). Moscow, Mashgiz, 1957, pp 22-37

ABSTRACT: A description is provided of a flow sheet for the production of blanks for the blades of clasp knives. The blank consists of a flat base and a cutting blade; it is wedge-shaped in cross section. The blade is of shaped contour. Rolling was introduced in place of stamping to reduce the stresses of deformation. Sheet Al 1.4 mm thick and 5-10 mm wide was used in the experiment. The blank was cut on a guillotine and broken down between rolls. Calculations are adduced for the minimum running thickness of the blank, the contact area and the mean unit pressures. The experiments conducted confirm conclusions relative to the shape of the tool and yield data for the planning of the process procedure. A.I.

Card 1/1

1. Cutting tools--Production 2. Aluminum--Processing
3. Rolling mills--Performance

BELAYEV, S. M.

BELAYEV, S. M. --"Gastrophylesis of Horses and Measures Against it."*(Dissertation for Degrees in Science and Engineering Defended at USSR Higher Educational Institutions) Min of Higher Education USSR, Kharkov Veterinary Inst, Kharkov, 1955

SO: Knizhnaya Letopis', No. 25, 18 Jun 55

* Degree of Candidate in Veterinary Sciences

BELYAYEV, S.M., veterinarnyy vrach.

Gastrophiliasis in horses and methods of controlling it.
Veterinariia 31 no.2:29-31 F '54. (MLRA 7:2)
(Horses--Diseases)

BELYAYEV, S. N.

"Gastrophylosis of Horses and Its Control." Cand Vet Sci, Moscow Veterinary Acad, Moscow, 1953. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

BITNER, Z.F.; LAVRENT'YEV, A.F.; BELYAYEV, S.L.

Increasing the service life of spindles. Metallurg 8 no.2:33 F '63. (MIRA 16:2)

1. Chelyabinskiy metallurgicheskiy zavod.
(Rolling mills—Design and construction)

ZASLOV, V.Ya.; MURZIN, G.A.; PAVLOV, O.V.; BELYAYEV, S.G.; ETINGOV, S.I.

Powered tool for installing roof bolting. Gor.zhur. no.4:55-58 Ap '64. (MIRA 17:4)

1. Nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut gornogo i obogatitel'nogo oborudovaniya (for Zaslov, Murzin, Pavlov, Belyayev). 2. Severoural'skiye boksitovyye rudniki (for Etingov).

BELYAYEV, S.

Role of public participation in scientific and technical progress. Mias.ind. SSSR 34 no.3:3-5 '63. (MIRA 16:7)

1. TSentral'noye pravleniye Nauchno-tekhnicheskogo obshchestva rabotnikov pishchevoy promyshlennosti.

ZASLOV, V.Ya., inzh.; PAVLOV, O.V., inzh.; BELYAYEV, S.G., inzh.

Mechanization of theerection of rod bolting. Gor.zhur. no.5:46-48 My '62. (MIRA 16:1)

1. Nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut gornogo i obogatitel'nogo oborudovaniya, Sverdlovsk.
(Mine roof bolting)

BELYAYEV, S.F., inzh.

Over-all mechanized lines for the processing of grapes. Mekh.i avtom.proizv. 16 no.12:23-25 D '62. (MIRA 16:1)
(Georgia--Wine and wine making)

BELYAYEV, S.F., inzh.

Designing transfer-machine lines for the food industry. Mekh.i avtom.proizv. 16 no.4:6-10 Ap '62. (MIRA 15:4)
(Food industry--Equipment and supplies)

BELYAYEV, S.A.

Work with semiprofessional medical personnel in Kalinin Province.
Zdrav. Ros. Feder. 5 no. 4:41-42 Ap '61. (MIRA 14:4)
(KALININ PROVINCE--MEDICAL PERSONNEL)

BELYAYEV, S.; GEROYEVA, M.

Alma-Ata Meat Combine during the years of the seven-year plan. Mias.ind. SSSR 33 [i.e.34] no.2:28-29 '63. (MIRA 16:4)

1. Nauchno-tekhnicheskoye obshchestvo pishchevoy promyshlennosti (for Belyayev). 2. Alma-Atinskiy myasokonservnyy kombinat (for Geroyeva). (Alma-Ata--Meat industry)

BURTSEV, L.; BELYAYEV, S.

Great potentials for increasing the productive capacity. Mias. ind.SSSR 33 no.2:5-10 '62. (MIRA 15:5)

1. Gosplan SSSR (for Burtsev). 2. Vsesoyuznyy nauchno-issledovatel'skiy institut myasnoy promyshlennosti (for Belyayev).
(Meat industry)

KURBATOVA, Ye.; MELYAYEV, S.; GENERALOV, N.

Universal mechanized line for processing swine and removing the butt of the hide. Mias. ind. SSSR 31 no.4:7-10 '60.
(MIRA 14:7)
(Pork industry)

BELYAYEV, S.; CHERNOIVANNIK, A.

Mechanized production of ice cream. Sov. torg. 34 no. 1:51-53 Ja '61. (MIRA 14:1)
(Ice cream industry)

BELYAYEV, Remir Aleksandrovich. Prinimal uchastiye DANILOV, Yu.I.; BUDNIKOV, P.P., akademik, red.; KALYUZHNAYA, T.P., red.; MAZEL', Ye.I., tekhn. red.

[Beryllium oxide, its properties and uses]Okis' berilliia; svoistva i primenenie. Pod red. P.P.Budnikova. Moskva, Gossatomizdat, 1962. 238 p. (MIRA 15:12)

1. Akademiya nauk Ukr.SSR (for Budnikov).
(Beryllium oxide)

Systems with beryllium oxide and...

974-5, Feb. 12, 1952 and J. Loeffler, Verres et rifract, 8, no. 3, 138 (1954) were cited. There are 2 figures, 1 table and 89 references: 20 Soviet-bloc and 69 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: P. Murray, Nuclear Power, May, 89 (1959); C. E. Weitz, A. van Valkenburg, J. res. nation. bureau stand., 64 A, no. 1, 103 (1960); R. A. Potter, L. A. Harris, Ceramic laboratory, Metallurgy div. Oak Ridge National laboratory, operated by Union Carbide Nuclear Co for the Atom. Energy Commissions, 1958; E. H. Hamilton, G. W. Cleek, J. res. bureau stand., 60, 693 (1958).

ASSOCIATION: AN USSR (AS UkrSSR)

Card 2/2

S/063/61/006/006/003/006
A057/A126

AUTHORS: Budnikov, P. P., Academician, Belyayev, R. A.

TITLE: Systems with beryllium oxide and their practical application

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva imeni D. I. Mendeleyeva, v. 6, no. 6, 1961, 629 - 635

TEXT: A review of investigations on systems of beryllium oxide with other oxides is presented. These systems containing beryllium oxide became important because of various valuable properties. Beryllium oxide is the best matrix for uranium dioxide and thorium dioxide. Porcelain wares containing BeO have outstanding heat resistance properties. Also many different glass types contain BeO, as for instance the well known "Lindemann glass" which is especially suited for x-rays. Production of these glasses started in the USSR in 1931. BeO-containing glasses can have very different properties, such as a high dispersion factor, a small refraction index, good transparency for ultraviolet rays, high resistivity to water or chemical agents, etc. Two-, three-, four- and five-component BeO-containing systems are cited with short discussions and corresponding references. Among the five-component glass systems those published in the USA Patent 2, 584,

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S/080/60/033/009/001/021
A003/A001

Beryllium Oxide and Its Properties

dispersed form, like fumes. There are 17 figures, 23 tables and 61 references: 21 Soviet, 18 English, 15 American and 7 German.

SUBMITTED: April 25, 1960

Card 3/3

Beryllium Oxide and Its Properties

oxide and zirconium oxide. It has been shown that the effect of radiation on BeO decreases with rising temperature. Among highly-refractive oxides BeO is one of the least volatile. Its volatility can be decreased still further by adding oxides of low volatility, like those of magnesium, calcium, strontium, barium, aluminum and silicon. This is explained by the formation of isomorphous and chemical compounds between the oxides and BeO. Beryllium oxide does not interact with hydrogen peroxide, SO_2, sulfur, bromine, and iodine. Below 700°C there is no interaction with CS_2. Gaseous hydrogen halides do not react with calcinated BeO even at red heat. Beryllium oxide is easily dissolved in molten alkalis, alkali carbonates and pyrosulfates. It is resistant, however, to alkaline solutions. The reduction of BeO by carbon is the most difficult of all oxides. Under neutral or reducing conditions BeO is resistant to the action of iron or similar metals. Besides BeO the oxide Be_2O is known which is stable under normal conditions. The only chemical compound in the system $BeO-SiO_2$ is phenacite (Be_2SiO_4) which is dissociated to BeO and SiO_2 at 1,560°C. The following binary systems were studied: $BeO-TiO_2$ (Ref 49), $BeO-Al_2O_3$ (Ref 48), $BeO-UO_2$ (Ref 53), $BeO-Cr_2O_3$ (Ref 55) and various ternary systems (Refs 49, 50, 54, 57, 58, 59). BeO like all other Be compounds, is highly toxic, especially in highly

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S/080/60/033/009/001/021
A003/A001

AUTHORS: Budnikov, P.P., Belyayev, R.A.

TITLE: Beryllium Oxide and Its Properties

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol. 33, No. 9, pp. 1921-1940

TEXT: Beryllium oxide has a high refractoriness, favorable nuclear properties and a good resistance to heat impact which make it suitable as structural material in nuclear, especially high-temperature, reactors. Its relatively low vapor pressure permits it to be used in the vacuum technology at temperatures of up to 2,000°C. The refractive index, microhardness, volumetric weight, thermodynamic properties, etc were studied earlier (Refs 1, 3, 11, 16-19). The resistance of BeO to stretching is lower than to compression (Tables 9-10, Figures 4-6). Articles made from BeO show a thermoplastic flow ("creep") starting from a temperature of 1,000°C. BeO has a high specific electric resistance combined with a high heat conductivity. At 630°C the electric resistance is $3.85 \cdot 10^8\ \Omega \cdot$ cm, at 1,000°C $5.2 \cdot 10^6\ \Omega \cdot$cm (Ref 3). The magnetic susceptibility of BeO is zero. The dielectric constant at room temperature is 7.35. The high heat-resistance of BeO can be increased still further by adding 0.5% of a mixture of aluminum

Card 1/3

L 39482-66 EWT(m)/T/EWP(t)/ETI/EWP(k) IJP(c) DJ/JD/HW/GD

ACC NR: AP6002896 (A) SOURCE CODE: UR/0286/65/000/024/0052/0052

AUTHOR: Nikolayeva, Z.V.; Belyayev, P.P.

ORG: none

TITLE: Method of obtaining grease for the rolling of metals. Class 23, no. 177015

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 52

TOPIC TAGS: grease, metal rolling, petroleum product

ABSTRACT: A method of using oxidized petrolatum as grease for the rolling of metals is proposed.

SUB CODE: 11,13 / SUBM DATE: 08Apr64

Card 1/1

BELYAYEV, P. P.

"Kontaktlose Strombertragung bei der chemischen und elektrochemischen Metallbearbeitung."

report presented at the VII Intl. Colloq. Ilmenau Inst. of Technology, Ilmenau GDR, 22-26 Oct '62.

Electrolytic Pickling of Sheets With Industrial Frequency a-c Current

77465
SOV/133-60-1-26/30

tank (f) (capacity: 0.3 m^3), pickling bath (g) capacity: 1.2 m^3), and reserve tank (capacity: 2.0 m^3), from which it may be transferred for regeneration along line (i). The Fe content should not exceed 100 g/l. Contaminated air is exhausted by fan (j) (capacity: 6000 m^3/h) by way of hood (k). The method is effective in cleaning sheets, continuously moving strip, and wire as well as for the treatment of inner and outer tube surfaces. Advantages: (1) higher quality of product; (2) improved working conditions; (3) decrease in manual labor; (4) saving in power and chemicals. There are 3 figures; 1 table; and 4 Soviet references.

ASSOCIATION: Scientific Research Institute of Chemical Machinery (NIIKhIMMASh)

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Electrolytic Pickling of Sheets With Industrial Frequency a-c Current

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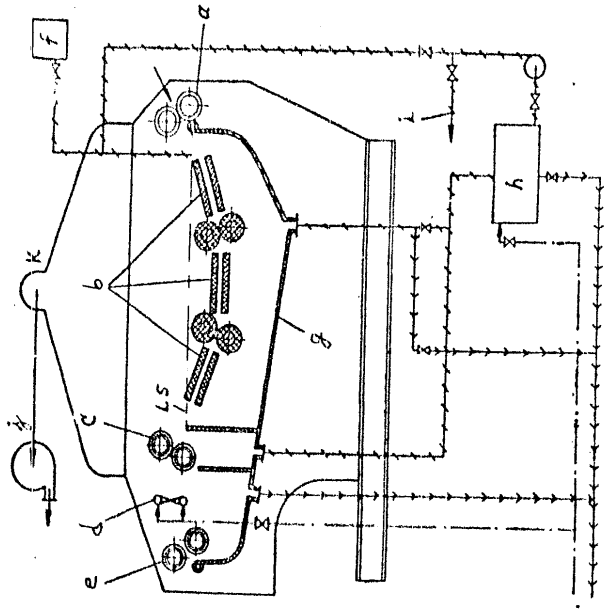
Fig. 3. Diagram of bath for electrolytic pickling by a-c Current. LS is level of solution (other explanations in text).



Card 4/5

Electrolytic Pickling of Sheets With Industrial Frequency a-c Current

77465
SOV/133-60-1-26/30

The sheets were free of imperfections, contrary to pickling without current when 38% had surface flaws. Tests with bright annealed hot and cold rolled sheets were successful. Hydrogen and oxygen liberation due to the electrolytic dissociation of water was not observed. Based on industrial tests, the authors recommend a pickling unit, as shown in Fig. 3, to be located between mechanized sheet feed and fluxing machine in the hot tin-plating installation. Sheets are fed to rollers (a) and pass two sections of electrolytic treatment between three sets of graphite electrodes (b) The distance between the sheets and graphite plates is 70mm and the total length of sheet travel under the current amounts to 840 mm. Time of treatment is calculated from $t = l : v$, where t = time (min); l = length of sheet travel (m); v = rate of sheet movement (m/min). With a rate of sheet movement of 15 m/min, the treatment lasts 3.5 sec. The clean sheet passes through extraction rollers (c), water jet (d), and water extraction rollers (e). The pickling solution circulates through pressure

Card 3/5

concentration can be used. The basic metal dissolved 50% less than in anodic treatment with d-c current. After successful laboratory tests the method was verified under industrial conditions on an installation for 512 × 712 mm sheets. Pulling rolls moved the sheet at 6.1-11.3 m/min. Results are shown in table A.

Table A Results of experimental chemical and electrolytic pickling of sheets by a-c current.

PARAMETERS	Serial Number of Batches					
	1	2	3	4	5	6
Current, a.	240	240	360	360	360	—
Voltage on electrodes, v	2,8	2,8	5,5	5,5	5,5	—
Current density on electrodes, a/dm² . .	4	4	9	9	9	—
Pickling time, sec	9	9	6	3,2	6	6
Acid Concentration, g/l .	23	20	17,2	17,2	17,0	17,0
Production of FIRST-Grade tin Plated Sheets, %	69	73	70	74	71	48

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18.7300

7706
307/133-60-1-26/33

AUTHORS: Belyayev, P.P., Nikitin, B.A., Sukhov, S.I.

TITLE: Electrolytic Pickling of Sheets With Industrial Frequency a-c Current

PERIODICAL: Stal', 1960, Nr 1, pp 79-81 (USSR)

ABSTRACT: The authors propose a method of contactless electrolytic pickling by means of 50-cycle a-c current with the help of a device mounted in the hot plating unit. Calculations made by one of the authors (P.P. Belyayev, Transactions of Vil'nyus Conference Concerning Electrochemistry, 1956, Publishing House of Lithuanian Academy of Sciences 1957) show that electrolytic pickling is possible in low concentration solutions within $1 \cdot 10^{-4}$ sec. During experimental pickling in hydrochloric acid done by the Scientific Research Institute of Chemical Machinery (NIIKhIMMASh) the formation of a passive indiscoluble film was not observed, proving that lower acid

Card 1/5

BELYAYEV, P.P., kand.khimicheskikh nauk.

Rapid cleaning processes with the help of emulsifiers. Trudy NIIKHIMMASH no.28:78-88 '59. (MIRA 15:6)
(Metal cleaning)

FILIMONOVA, G.V., mladshiy nauchnyy sotrudnik; KUDRYAVTSEV, N.T., doktor khimicheskikh nauk, prof.; BELYAYEV, P.P., kand.khimicheskikh nauk.

Cathodic process in lead electroplating from alkaline electrolytes. Trudy NIIKHIMMASH no.28:61-77 '59. (MIRA 15:6)
(Lead plating)

FILIMONOVA, G.V., mladshiy nauchnyy sotrudnik; KUDRYAVTSEV, N.T., doktor khim. nauk; BELYAYEV, P.P., kand.khimicheskikh nauk.

Effect of organic additives on the solubility of lead in alkaline lead elctrolytes and their stability. Trudy NIIKHIMMASH no.28:55-60 '59. (MIRA 15:6)

(Lead plating)

BELYAYEV, P.P., kand.khimicheskikh nauk; NIKITIN, B.A., mladshiy nauchnyy sotrudnik

Acceleration of the solving of metallic tin in alkaline water solutions. Trudy NIIKHIMMASH no.28:3-11 '59. (MIRA 15:6)

(Tin) (Solution (Chemistry))

BELYAYEV, P. P.

Korrosionsschutz durch galvanische Metallueberzuege, b y W. Burkhardt, Leipzig

.....Zinn als Schutzmetall gewinnt wegen seiner Loetfaehigkeit bevorzugt in der elektrotechnischen Industrie, wegen seiner Ungiftigkeit fuer Verpackung und Konservierung in der Nahrungs- und Genussmittelindustrie Bedeutung. Ueber neue Erkenntnisse zur Stabilisierung der [redacted] Zinnelektrolyten und Verbesserung der Zinnabscheidung berichtet Beljajew. 10)

10) Beljajew, P.P., Moskau: Ueber neue stabilisierte Verzinkungselektrolyte und die Abscheidung einseitiger Zinnschichten, Referat zum Int. V. Kolloquium der Hochschule fuer Elektrotechnik Ilmenau, Oktober 1960.

SO: Chemische Technik, May 1961, p. 268, U.

BELYAYEV, P.P.

25(1) PHASE I BOOK EXPLOITATION SOV/3161

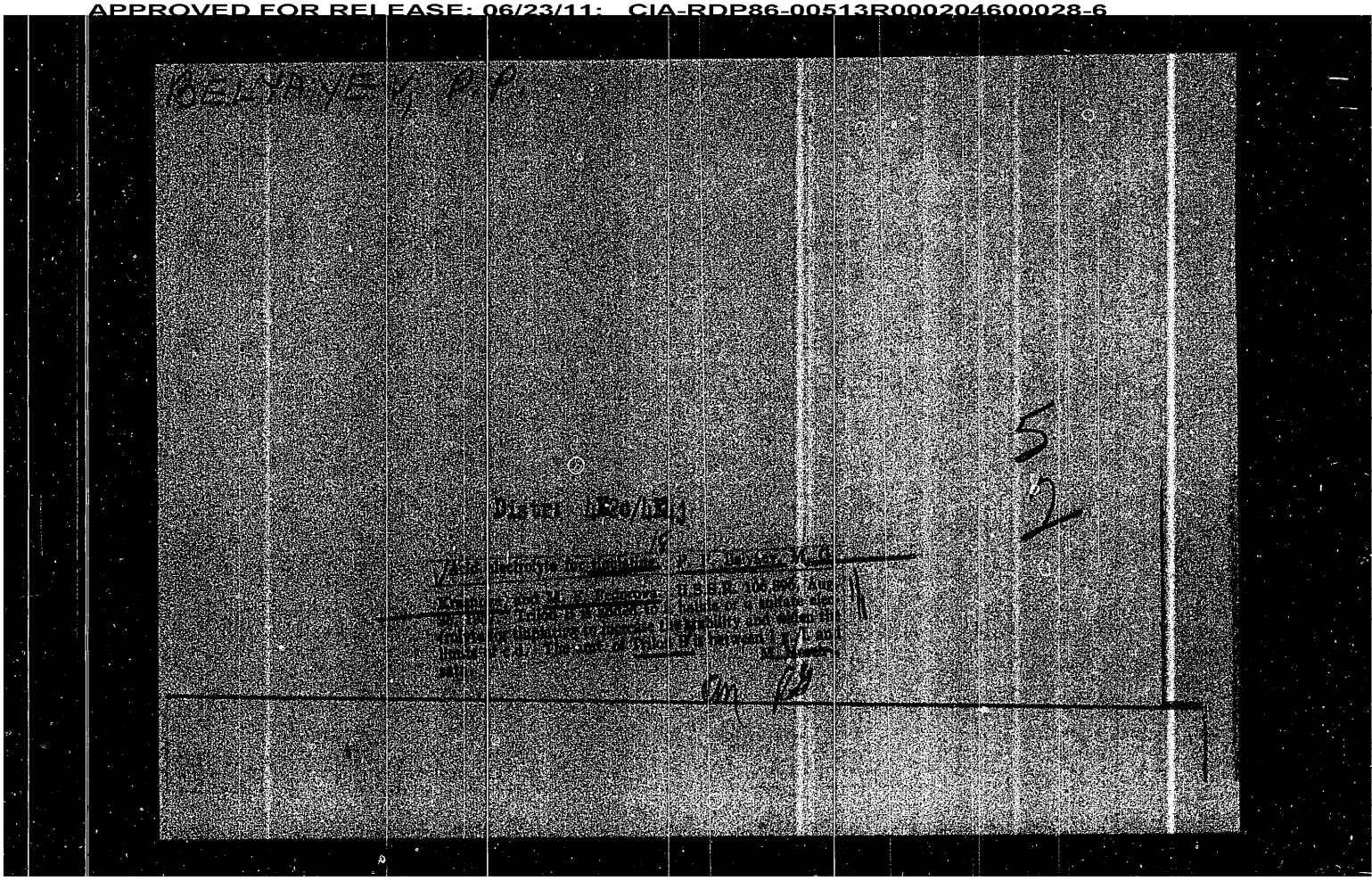
Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti, Kiyevskoye oblastnoye pravleniye

Zashchitno-dekorativnyye i spetsial'nyye pokrytiya metallov (Protective, Decorative, and Special Coatings for Metals) Kiyev, Mashgiz, 1959. 291 p. 4,200 copies printed.

Editorial Board: P. K. Lavorko, N. I. Litvak, and A. P. Rychis (Resp. Ed.); Ed. of Publishing House: M. S. Soroka; Chief Ed. (Southern Division, Mashgiz): V. K. Serdyuk, Engineer.

PURPOSE: This book is intended for technical personnel in the field of protective coatings for metals.

COVERAGE: The papers in this collection, presented at a conference of the NTO Mashprom held in Odessa, deal with the mechanization and acceleration of metal-coating and plating processes performed by spraying, electrolytic, and other methods. Quality control of protective coatings is also discussed. No personalities are mentioned. References follow several of the papers.



BELYAYEV, P.P., kandidat khimicheskikh nauk; CHERNENKO, Ye.A., mladshiy nauchnyy sotrudnik; FEDOROVA, M.F., mladshiy nauchyy sotrudnik.

Tin plating in a sulfate electrolyte. Sbor.st.NIIKHIMMASH no.15:74-90 '54. (MLRA 10:1)

(Tin plating)

BELYAYEV, P.P., kandidat khimicheskikh nauk; KRASNOVA, M.G., mladshiy nauchnyy sotrudnik.

Electrolytic crystallization of lead and zinc. Sbor.st.NIIKHIMMASH no.15:42-56 '54. (MLRA 10:1)
(Lead plating) (Zinc plating) (Crystallization)

ILLEGIBLE

BELYAYEV, P.P.

✓Electrolytic treatment of metals. P. P. Belyaev. *Metall. Pokrytiya v Khim. Mashinostroenii. Vsesoyuz. Nauch.-Issledovatel. Konstruktor. Inst. Khim. Mashinostroeniya* (Moscow), *Sbornik Statei* 15, 3-21(1954); *Referat. Zhur., Khim.* 1954, No. 40972.—The relation between at. structure, chem., and electrochem. properties of metals and the mechanism of transfer of charged particles in a current is discussed. M. Hosch

MG
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ILLEGIBLE

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Met Gbl.
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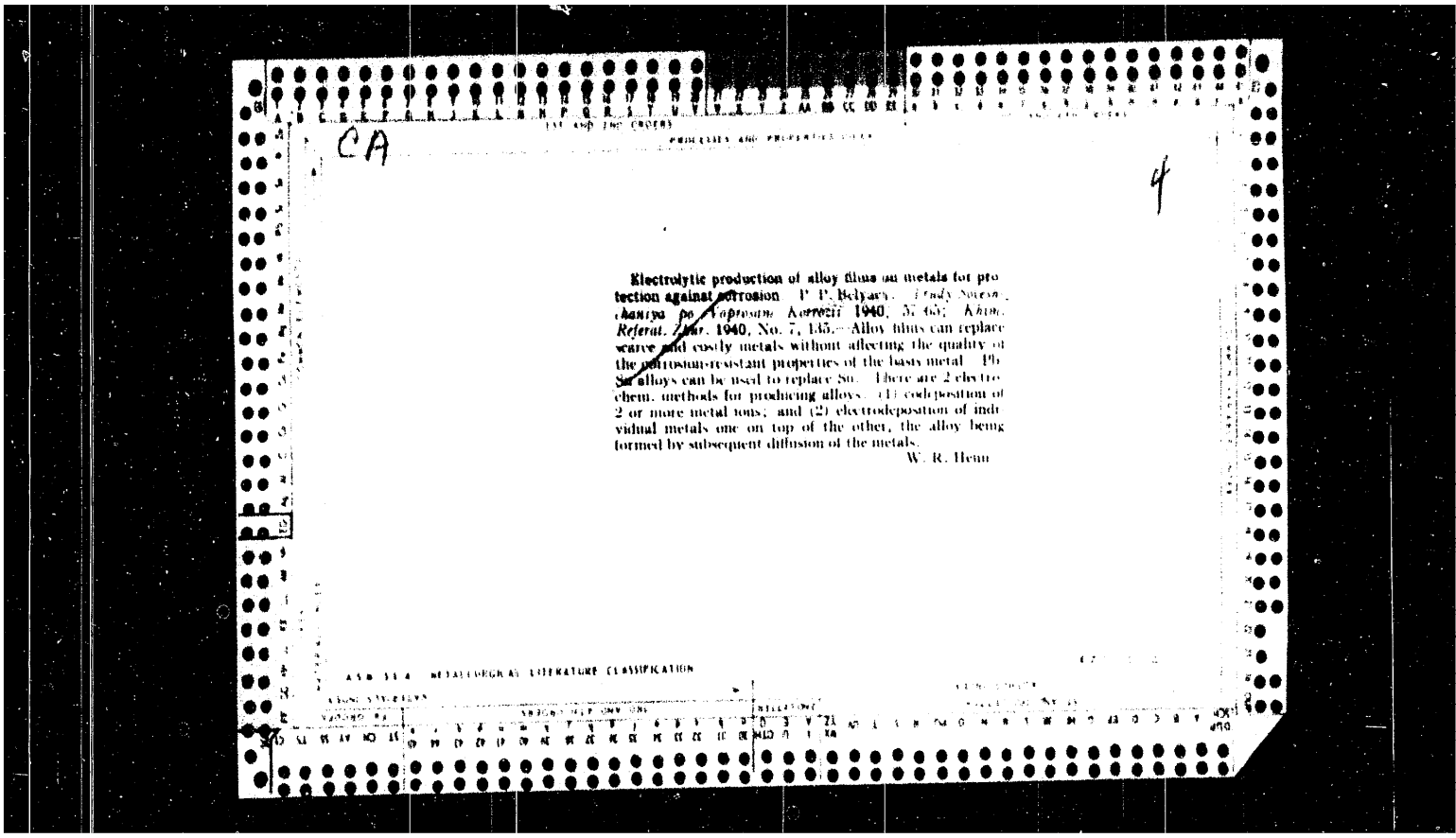
Electrodeposition
6

'Electroplating with Tungsten and Molybdenum. P. P. Belyaev and A. I. Lopvetskaya (*Korroziya i Bor'ba s Ni* (*Corrosion and the Fight Against It*), 1940, **6**, (2), 47; *C. Abs.*, 1942, **36**, 3735). [In Russian.] Experiments were made on depositing tungsten–nickel alloy from $(NH_4)_2WO_4$ baths. The anodes were platinum, the c.d. was 50 amp./dm.^{2}, and the bath temperature 75° C. The electrolyte contained $(NH_4)_2SO_4$ 150, NH_4 60, tungsten as H_2WO_4 3–9, and nickel as $NiSO_4.7H_2O$ 1–3 grm./litre. During plating, nickel salt was periodically added so as to keep the tungsten : nickel ratio at 3 : 1. The deposits adhered very firmly to the basis metal (platinum and steel), and were stable in H_2SO_4. Qualitative experiments on depositing an alloy of tungsten–tin were carried out. The electrolyte contained bivalent tin in solution of KCN. Results were unsatisfactory, owing to an unfavourable potential ratio between hydrogen and tungsten under the conditions of the experiments. The method of Paal for depositing molybdenum from acid electrolytes was tested by using a solution of MoO_3 in HCl. However, the results were unsatisfactory, no metallic molybdenum being deposited.



CA

4

Electrolytic production of alloy films on metals for protection against corrosion. P. P. Belyaev. *Trudy Novoch. Obshchestva po Zashchite Metallov* **1940**, 37–65; *Khim. Referat. Zhur.* **1940**, No. 7, 135.—Alloy films can replace scarce and costly metals without affecting the quality of the corrosion-resistant properties of the basic metal. Pb–Sn alloys can be used to replace Sn. There are 2 electrochem. methods for producing alloys: (1) codeposition of 2 or more metal ions; and (2) electrodeposition of individual metals one on top of the other, the alloy being formed by subsequent diffusion of the metals.

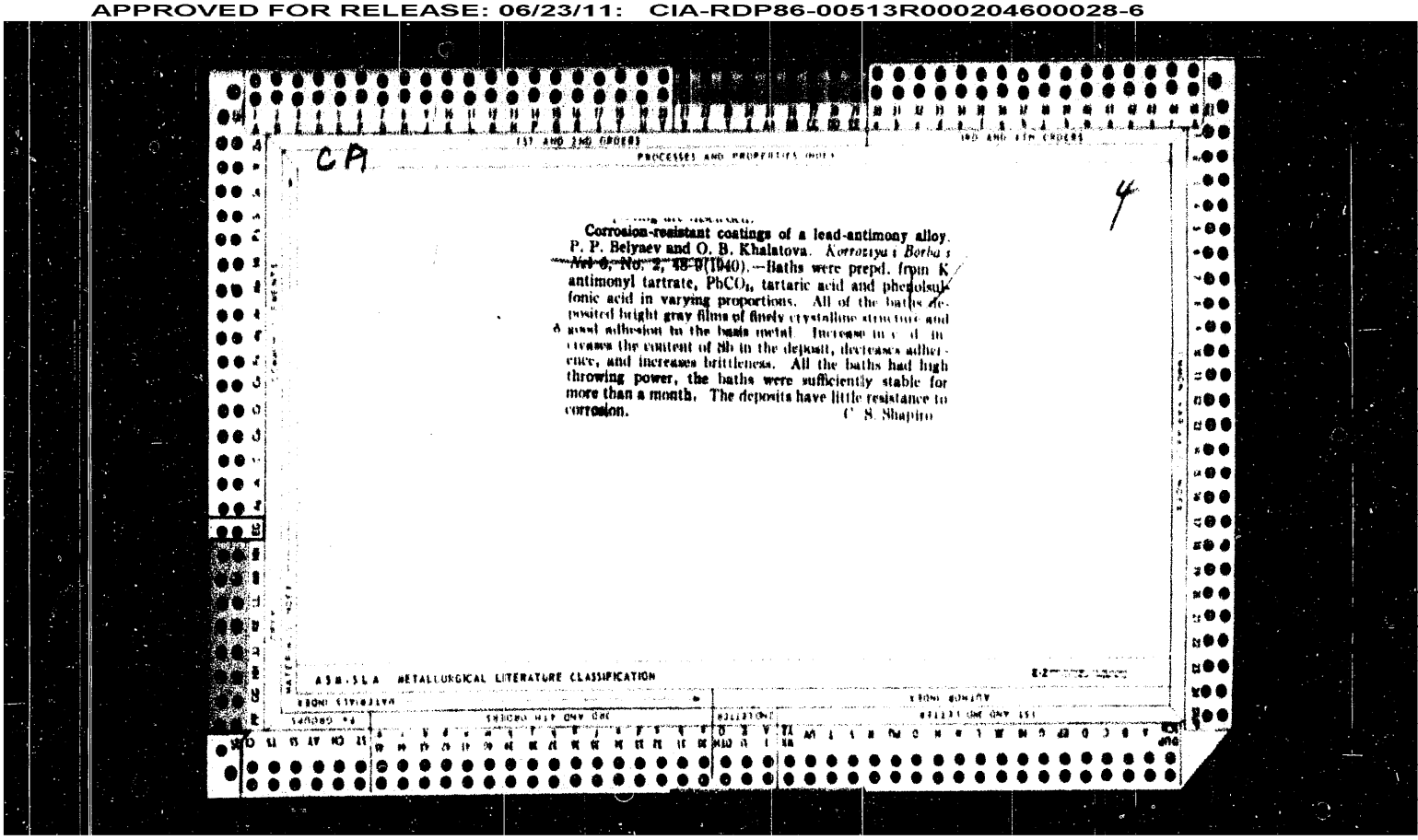
W. R. Heun

Protection 5

Met Abs
V. 9

***Protective Corrosion-Resistant Films on Metal Products of Deeply Recess[ed] Contour.** P. P. Belyaev, *et al.* (*Korroziya i Bor'ba s Nei* (*Corrosion and Fight Against It*), 1940, **6**, (2), 40-50; *C. Abs.*, 1942, **36**, 3730). [In Russ[ian].]

[E]xperiments showed that electrodeposited zinc, copper, or 90 : 10 brass does [no]t protect the recessed or back surfaces of articles against corrosion. Phos[ph]atization (on an iron base), as such, is of little value unless the rear surface [is] coated with oils or lacquer. But phosphatization with solutions that render [t]he steel passive does make the entire surface resistant to corrosion. Thus, [tre]atment of an ordinary phosphatized surface with a 1% solution of $K_2Cr_2O_7$ [re]duces the corrosion considerably. Phosphatization of a zinc plated surface [giv]es high resistance to corrosion. It is especially recommended in cases [w]here additional treatment with oils or lacquers is required. This phos[ph]atization was carried out in a solution of $Zn_3(PO_4)_2$. The front deposit [w]as composed of a 20-μ zinc layer plus a phosphate layer. On the inside, [t]he zinc layer was absent, and only the phosphate film remained. This [st]eel piece in a 3% NaCl solution and in H_2O vapour at 18°-20° C. showed [n]o trace of corrosion on either side after 1000 hrs. In zinc-plating phos[ph]atized surfaces, to close the pores in the phosphatized layer, the inside [zi]nc often is not deposited on areas where the angle of curvature is very [hi]gh. This is probably due to the poor throwing power of the zinc bath. [I]n general, the corrosion-resistance of the inside or deeply recessed surfaces [w]as not more than ¼ of that of the outside or raised surfaces.

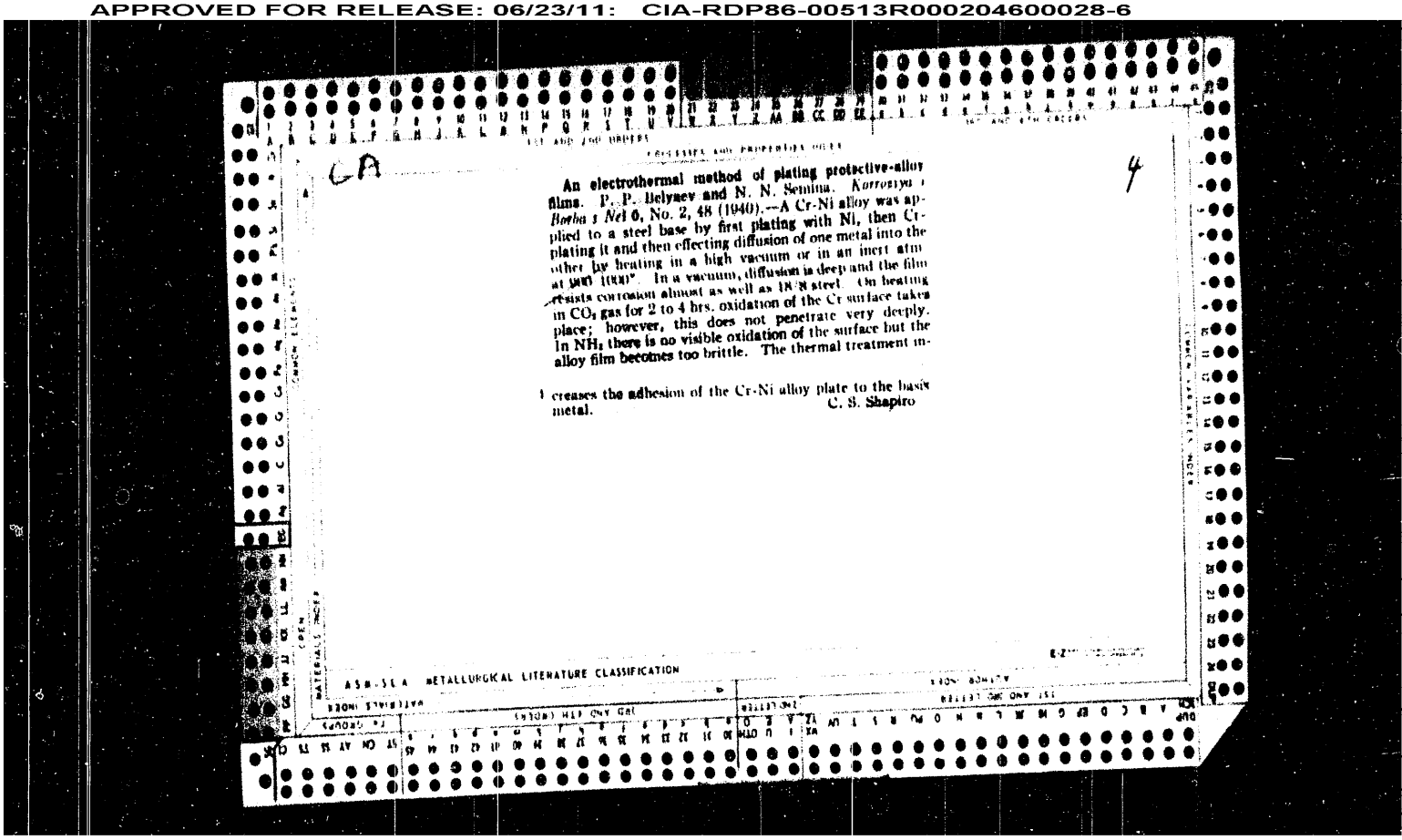


CP

4

Corrosion-resistant coatings of a lead-antimony alloy. P. P. Belyaev and O. B. Khalatova. *Korroziya i Borba s Nei*, No. 2, 18-9(1940).—Baths were prepd. from K antimonyl tartrate, $PbCO_3$, tartaric acid and phenolsulfonic acid in varying proportions. All of the baths deposited bright gray films of finely crystalline structure and good adhesion to the basis metal. Increase in acid increases the content of Sb in the deposit, decreases adherence, and increases brittleness. All the baths had high throwing power, the baths were sufficiently stable for more than a month. The deposits have little resistance to corrosion. C. S. Shapiro

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



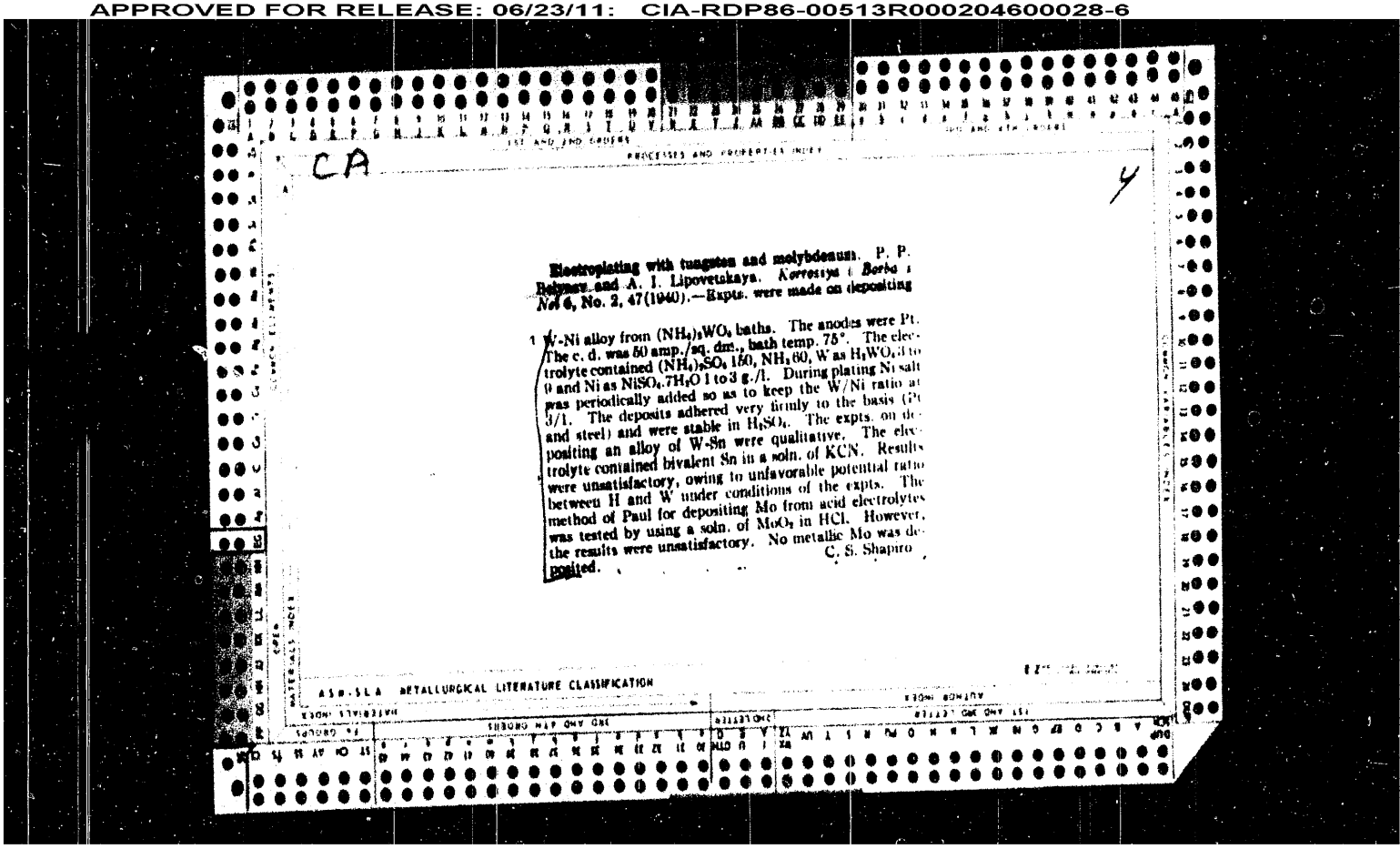
CA

4

An electrothermal method of plating protective-alloy films. P. P. Belyaev and N. N. Semina. *Korroziya i Borba s Nei* 0, No. 2, 48 (1940).—A Cr-Ni alloy was applied to a steel base by first plating with Ni, then Cr-plating it and then effecting diffusion of one metal into the other by heating in a high vacuum or in an inert atm at 900 (1000)°. In a vacuum, diffusion is deep and the film resists corrosion almost as well as 18-8 steel. On heating in CO_2 gas for 2 to 4 hrs. oxidation of the Cr surface takes place; however, this does not penetrate very deeply. In NH_3 there is no visible oxidation of the surface but the alloy film becomes too brittle. The thermal treatment increases the adhesion of the Cr-Ni alloy plate to the basis metal.

C. S. Shapiro

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



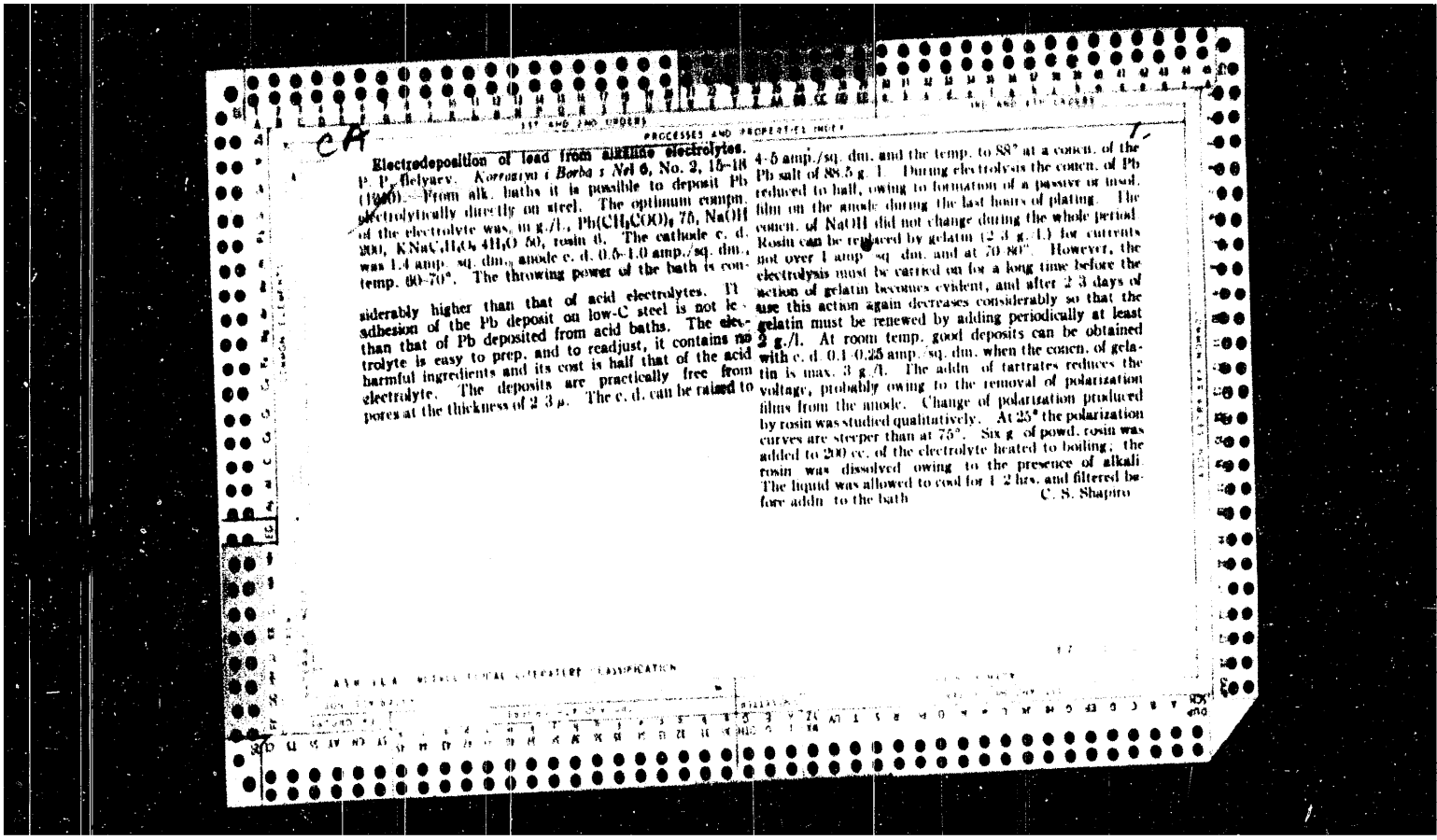
CA

4

Electroplating with tungsten and molybdenum. P. P. Belyaev and A. I. Lipovetskaya. *Korrozya i Borba s Nei* 6, No. 2, 47(1940).—Expts. were made on depositing W-Ni alloy from $(NH_4)_2WO_4$ baths. The anodes were Pt. The c. d. was 50 amp./sq. dm., bath temp. 75°. The electrolyte contained $(NH_4)_2SO_4$ 150, NH_3 60, W as H_2WO_4 3 to 9 and Ni as $NiSO_4.7H_2O$ 1 to 3 g./l. During plating Ni salt was periodically added so as to keep the W/Ni ratio at 3/1. The deposits adhered very firmly to the basis (Cu and steel) and were stable in H_2SO_4. The expts. on depositing an alloy of W-Sn were qualitative. The electrolyte contained bivalent Sn in a soln. of KCN. Results were unsatisfactory, owing to unfavorable potential ratio between H and W under conditions of the expts. The method of Paul for depositing Mo from acid electrolytes was tested by using a soln. of MoO_3 in HCl. However, the results were unsatisfactory. No metallic Mo was deposited.

C. S. Shapiro

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

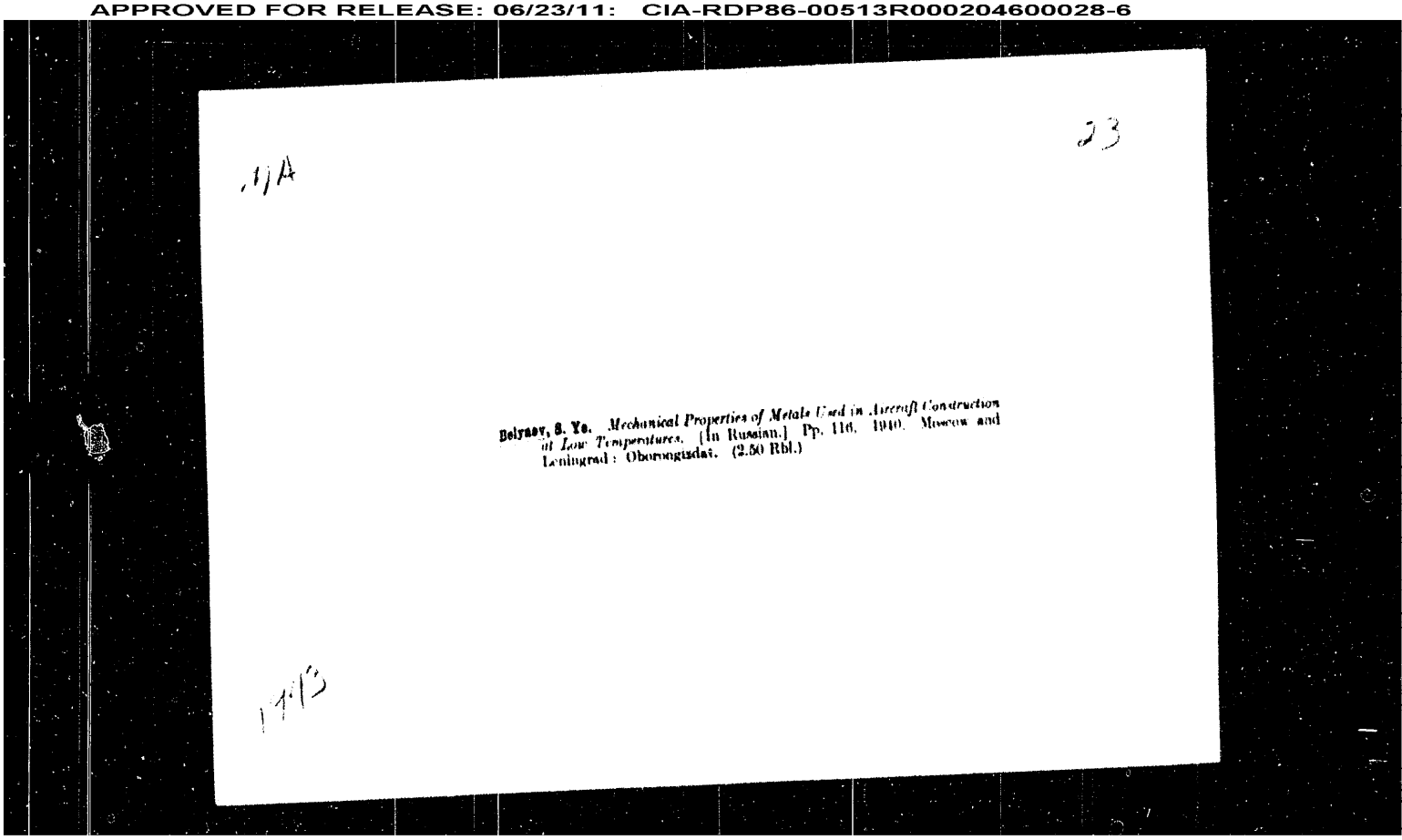


PROCESSES AND PROPERTIES INDEX

CA

Electrodeposition of lead from alkaline electrolytes.

P. P. Belyaev. *Korroziya i Borba s Nei* 6, No. 2, 15–18 (1940).—From alk. baths it is possible to deposit Pb electrolytically directly on steel. The optimum compn. of the electrolyte was, in g./l., $Pb(CH_3COO)_2$ 75, NaOH 200, $KNaC_4H_4O_6 \cdot 4H_2O$ 50, rosin 6. The cathode c. d. was 1.4 amp./sq. dm., anode c. d. 0.5–1.0 amp./sq. dm., temp. 60–70°. The throwing power of the bath is considerably higher than that of acid electrolytes. The adhesion of the Pb deposit on low-C steel is not less than that of Pb deposited from acid baths. The electrolyte is easy to prep. and to readjust, it contains no harmful ingredients and its cost is half that of the acid electrolyte. The deposits are practically free from pores at the thickness of 2–3 μ. The c. d. can be raised to 4–5 amp./sq. dm. and the temp. to 88° at a concn. of the Pb salt of 88.5 g./l. During electrolysis the concn. of Pb reduced to half, owing to formation of a passive or insol. film on the anode during the last hours of plating. The concn. of NaOH did not change during the whole period. Rosin can be replaced by gelatin (2–3 g./l.) for currents not over 1 amp./sq. dm. and at 70–80°. However, the electrolysis must be carried on for a long time before the action of gelatin becomes evident, and after 2–3 days of use this action again decreases considerably so that the gelatin must be renewed by adding periodically at least 2 g./l. At room temp. good deposits can be obtained with c. d. 0.1–0.25 amp./sq. dm. when the concn. of gelatin is max. 3 g./l. The addn. of tartrates reduces the voltage, probably owing to the removal of polarization films from the anode. Change of polarization produced by rosin was studied qualitatively. At 25° the polarization curves are steeper than at 75°. Six g. of powd. rosin was added to 200 cc. of the electrolyte heated to boiling; the rosin was dissolved owing to the presence of alkali. The liquid was allowed to cool for 1–2 hrs. and filtered before addn. to the bath. C. S. Shapiro

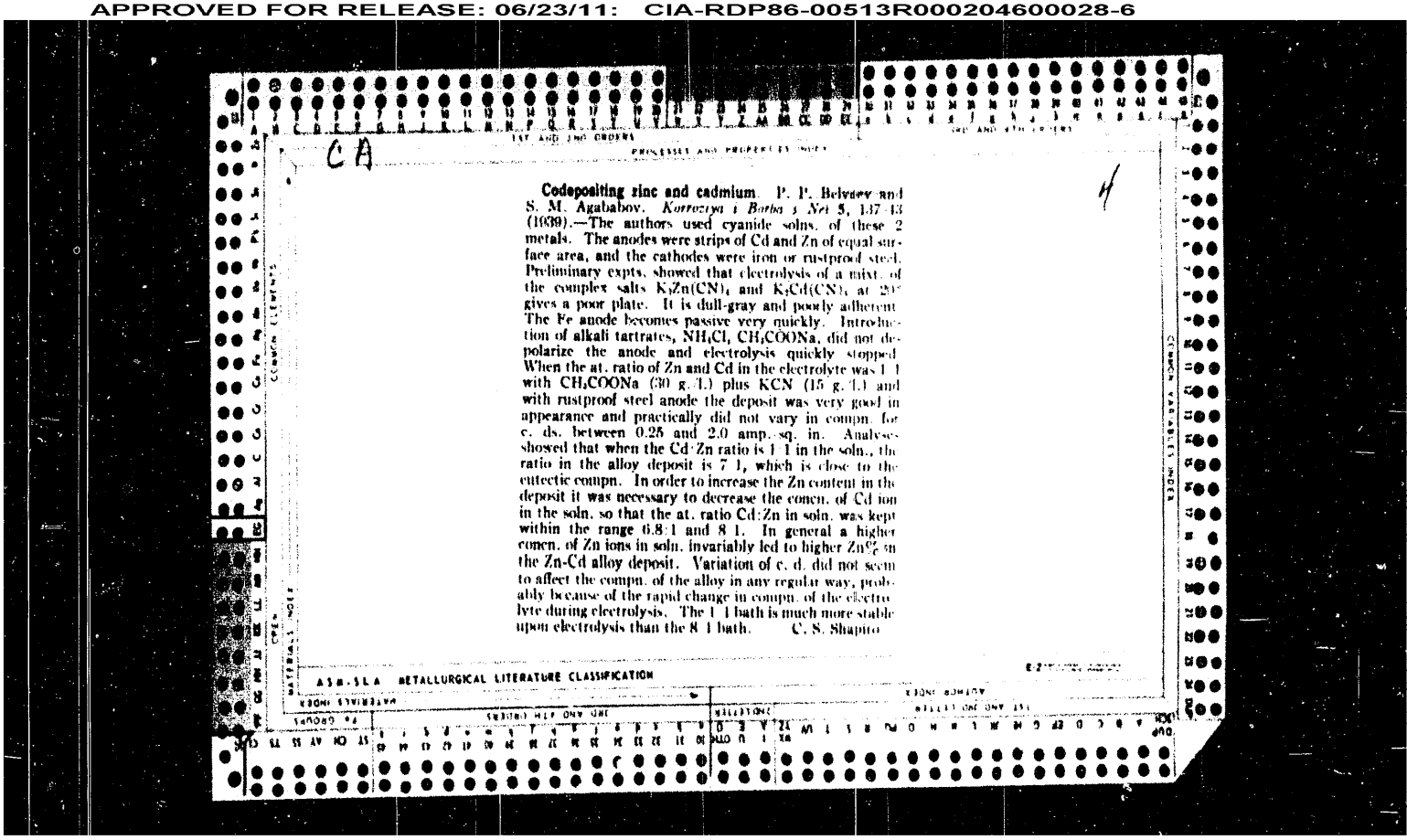


11A

23

Beiraev, S. Ye. *Mechanical Properties of Metals Used in Aircraft Construction at Low Temperatures.* [In Russian.] Pp. 116. 1940. Moscow and Leningrad: Oborongizdat. (2.50 Rbl.)

14-13



CA

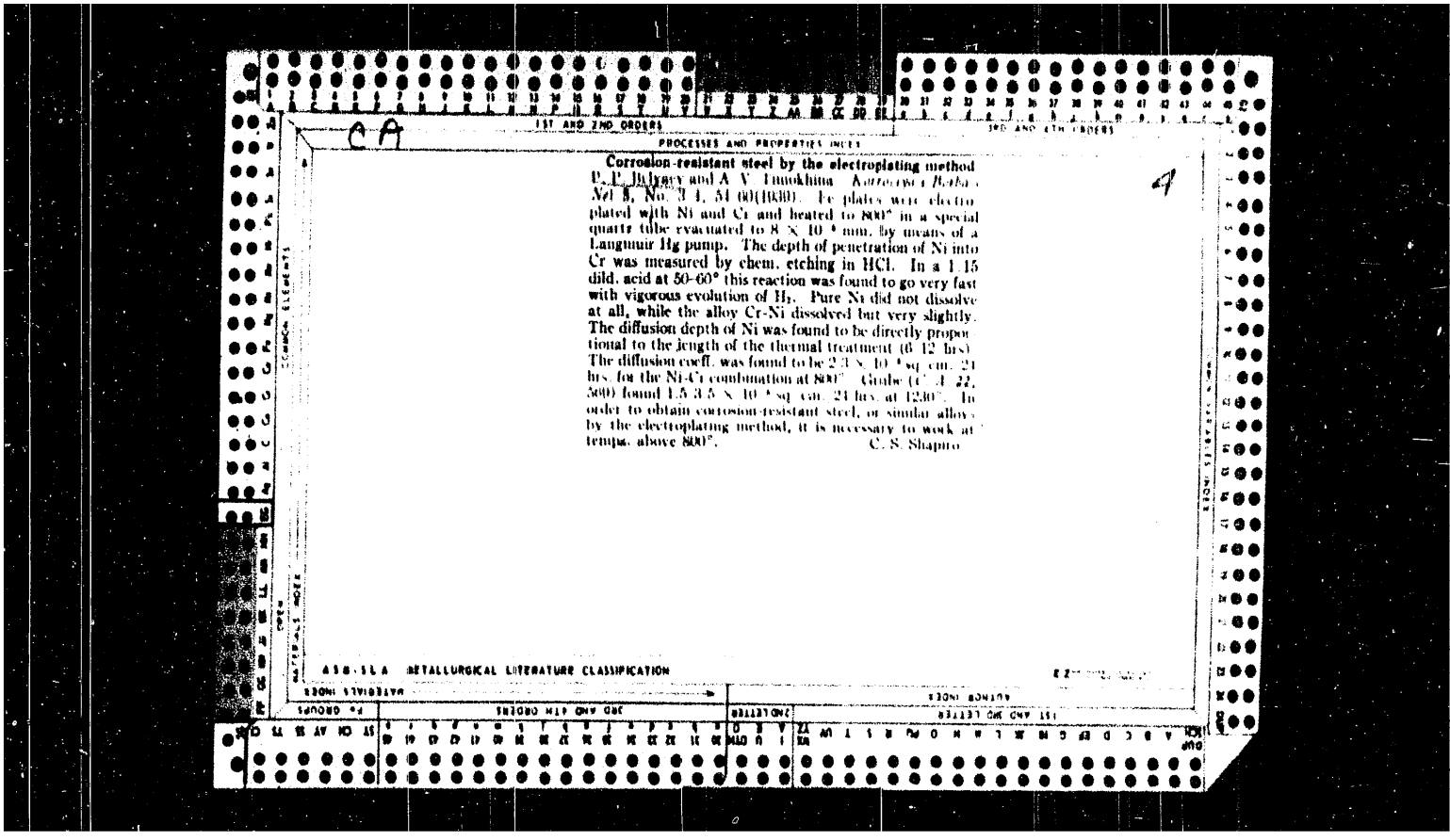
Codepositing zinc and cadmium. P. P. Belyaev and S. M. Agababov. *Korroziya i Borba s Nei* **5**, 137-43 (1939).—The authors used cyanide solns. of these 2 metals. The anodes were strips of Cd and Zn of equal surface area, and the cathodes were iron or rustproof steel. Preliminary expts. showed that electrolysis of a mixt. of the complex salts $K_2Zn(CN)_4$ and $K_2Cd(CN)_4$ at 20° gives a poor plate. It is dull-gray and poorly adherent. The Fe anode becomes passive very quickly. Introduction of alkali tartrates, NH_4Cl, CH_3COONa, did not depolarize the anode and electrolysis quickly stopped. When the at. ratio of Zn and Cd in the electrolyte was 1:1 with CH_3COONa (30 g./l.) plus KCN (15 g./l.) and with rustproof steel anode the deposit was very good in appearance and practically did not vary in compn. for c. ds. between 0.25 and 2.0 amp./sq. in. Analyses showed that when the Cd:Zn ratio is 1:1 in the soln., the ratio in the alloy deposit is 7:1, which is close to the eutectic compn. In order to increase the Zn content in the deposit it was necessary to decrease the concn. of Cd ion in the soln. so that the at. ratio Cd:Zn in soln. was kept within the range 6.8:1 and 8:1. In general a higher concn. of Zn ions in soln. invariably led to higher Zn% in the Zn-Cd alloy deposit. Variation of c. d. did not seem to affect the compn. of the alloy in any regular way, probably because of the rapid change in compn. of the electrolyte during electrolysis. The 1:1 bath is much more stable upon electrolysis than the 8:1 bath. C. S. Shapiro

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Mat. Abs.
V.9

6 Electrodeposition

Electrodeposition of Brass at High Current Densities. P. P. Polyanskii (*Korroziya i Bor'ba s Nei* (*Corrosion and the Fight Against It*), 1939, **5**, (5/6), 13–24; *C. Abs.*, 1942, **36**, 2211). [In Russian.] In cyanide brass solutions $Cu_2SO_3{\cdot}CuSO_4$ was used as addition salt, since it dissolves in KCN without CO_2 formation, and it does not require additional reducing agents. The reaction is $2(Cu_2SO_3{\cdot}CuSO_4) + H_2O + 18KCN = 6K_4Cu(CN)_3 + 3K_2SO_4 + H_2SO_4$. The concentration of copper and zinc must be high for the best results. When the copper ion concentration is 0·2–0·3*N* and the zinc ion concentration is 0·3–0·4*N*, good films are obtained at a c.d. of 1·2 amp. dm.$^{-2}$. If the anode is made of yellow brass (33% zinc), the plate composition approaches that of brass. Both the concentration of copper and zinc and the c.d. can be even higher than given above. The increase in copper and zinc concentration increases the yield slightly. At c.d. above 5 amp. dm.$^{-2}$ the current efficiency drops rapidly and the composition of the film changes markedly. The relation between c.d. and film composition is irregular at low c.d. Polarization is high, and the zinc concentration in the deposit increases with it. But there is no direct proportionality between deposit composition and electrode potential. Adding NaK tartrate stabilizes the bath, reduces slime formation, and makes electrolysis possible at high c.d. Introduction of $Na_2S_2O_3$, even in small quantities, produces brittleness in the brass deposits. The optimum conditions are: $CuSO_3{\cdot}Cu_2SO_3$ 0·15–0·2*N*, $ZnCO_3$ 0·4–0·5*N*, total KCN 0·6–0·8*N*, NaK tartrate 60 gm./litre, c.d. 1·2 amp. dm.$^{-2}$, 25° C., yellow-brass anode. Current efficiency is 55–60%; the deposit contains 60% copper and 40% zinc. For analysis of the electrolyte metal, the complex compounds were destroyed by treatment of 5 c.c. of the solution with 8 c.c. of H_2SO_4 and 1·2 c.c. HNO_3, the solution was evaporated, and the residue dissolved in 100 c.c. water. Copper was determined electrolytically at a c.d. of 1 amp. dm.$^{-2}$ for 45–60 minutes. After copper was removed, zinc was determined by $K_4Fe(CN)_6$ titration, with $UO_2(NO_3)_2$ as indicator at 70° C. Eight references.



CA

1ST AND 2ND ORDERS

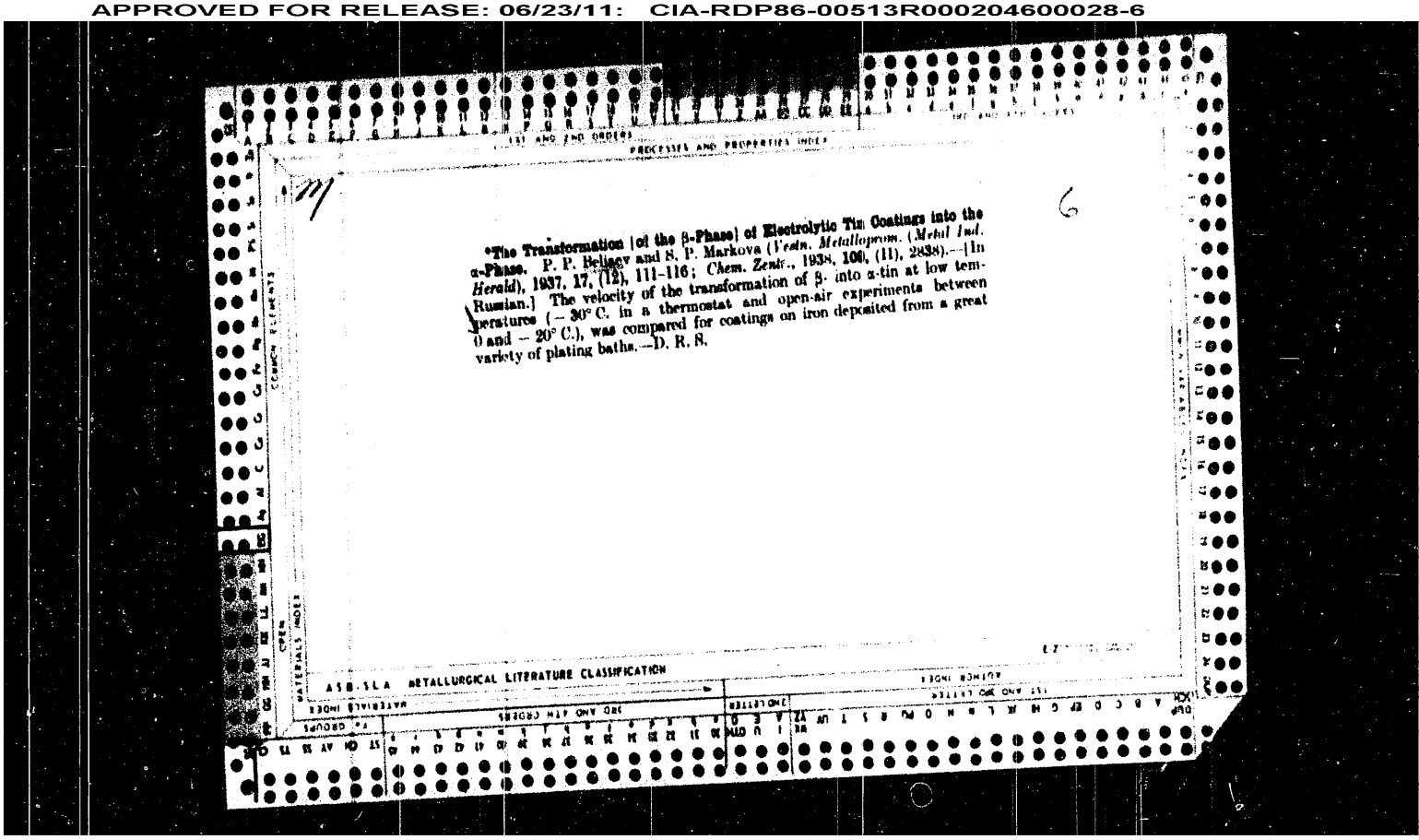
PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

4

Corrosion-resistant steel by the electroplating method P. P. Dubrovy and A. V. Tumokhina. *Avtogennoe Delo* No. 8, No. 3-4, 51-60(1938). Fe plates were electroplated with Ni and Cr and heated to 800° in a special quartz tube evacuated to 8×10^{-6} mm. by means of a Langmuir Hg pump. The depth of penetration of Ni into Cr was measured by chem. etching in HCl. In a 1:15 dild. acid at 50–60° this reaction was found to go very fast with vigorous evolution of H_2. Pure Ni did not dissolve at all, while the alloy Cr-Ni dissolved but very slightly. The diffusion depth of Ni was found to be directly proportional to the length of the thermal treatment (8–12 hrs). The diffusion coeff. was found to be 2.3×10^{-8} sq. cm. 24 hrs. for the Ni-Cr combination at 800°. Grube (*C. A.* **22**, 500) found $1.5-3.5 \times 10^{-8}$ sq. cm. 24 hrs. at 1230°. In order to obtain corrosion-resistant steel, or similar alloys by the electroplating method, it is necessary to work at temps. above 800°. C. S. Shapiro

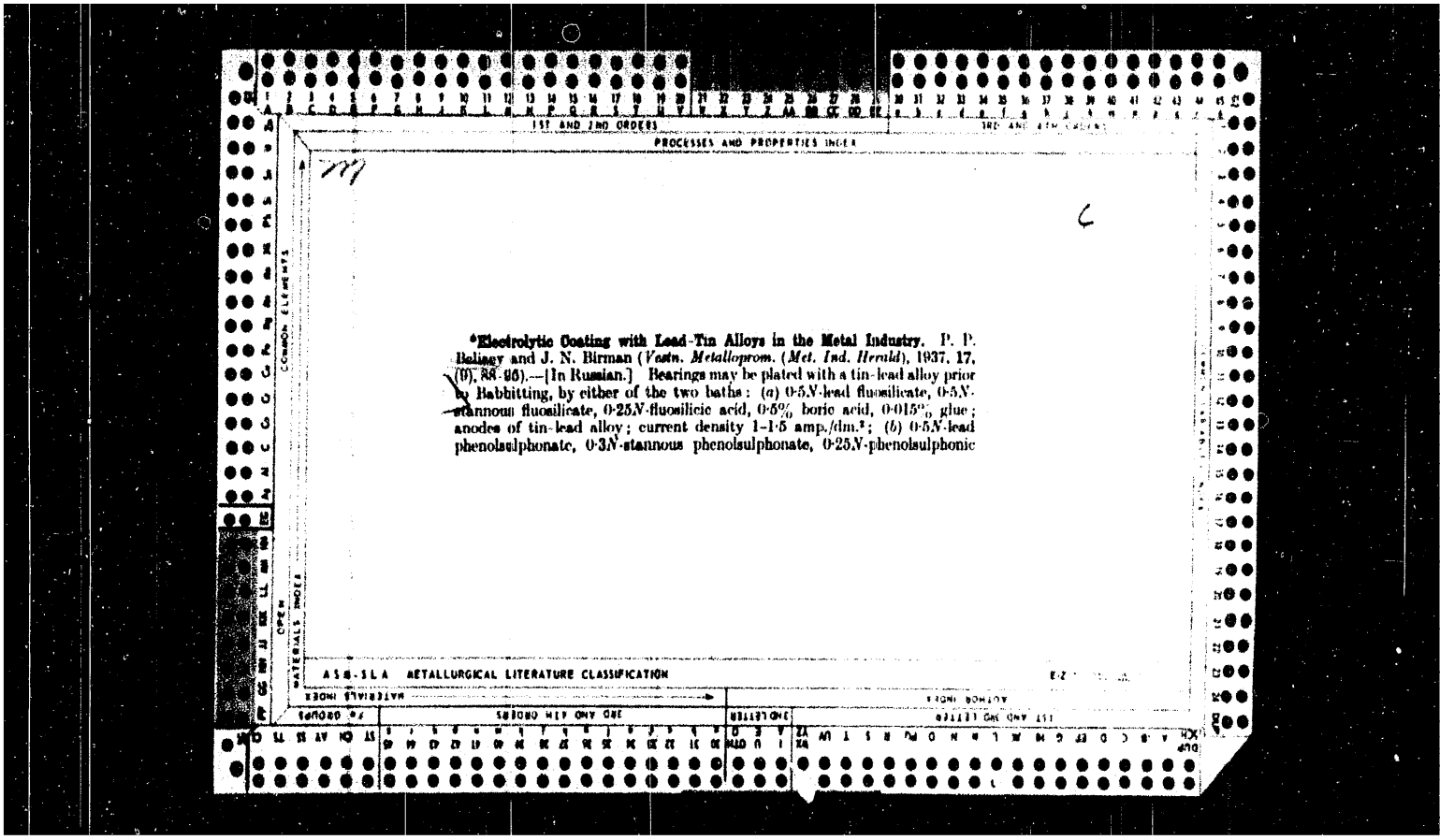
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



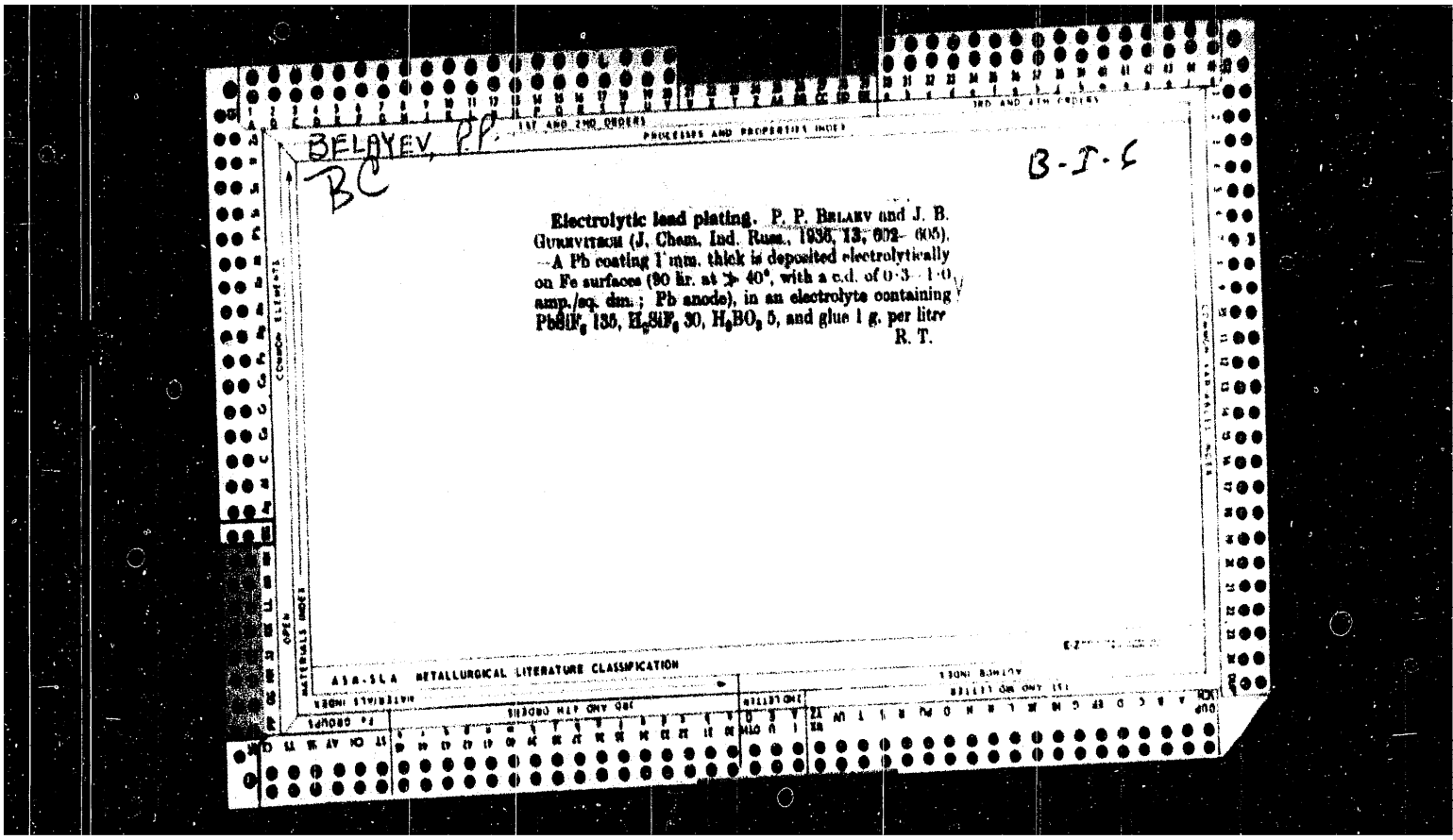
PROCESSES AND PROPERTIES INDEX

The Transformation [of the β-Phase] of Electrolytic Tin Coatings into the α-Phase. P. P. Beliaev and S. P. Markova (*Vestn. Metalloprom.* (*Metal Ind. Herald*), 1937, 17, (12), 111–116; *Chem. Zentr.*, 1938, 109, (11), 2838).—[In Russian.] The velocity of the transformation of β- into α-tin at low temperatures (– 30° C. in a thermostat and open-air experiments between 0 and – 20° C.), was compared for coatings on iron deposited from a great variety of plating baths.—D. R. S.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



***Electrolytic Coating with Lead-Tin Alloys in the Metal Industry.** P. P. Beligay and J. N. Birman (*Vestn. Metalloprom.* (*Met. Ind. Herald*), 1937, 17, (9), 88-95).—[In Russian.] Bearings may be plated with a tin-lead alloy prior to Babbitting, by either of the two baths: (*a*) 0·5*N*-lead fluosilicate, 0·5*N*-stannous fluosilicate, 0·25*N*-fluosilicic acid, 0·5% boric acid, 0·015% glue; anodes of tin-lead alloy; current density 1–1·5 amp./dm.²; (*b*) 0·5*N*-lead phenolsulphonate, 0·3*N*-stannous phenolsulphonate, 0·25*N*-phenolsulphonic

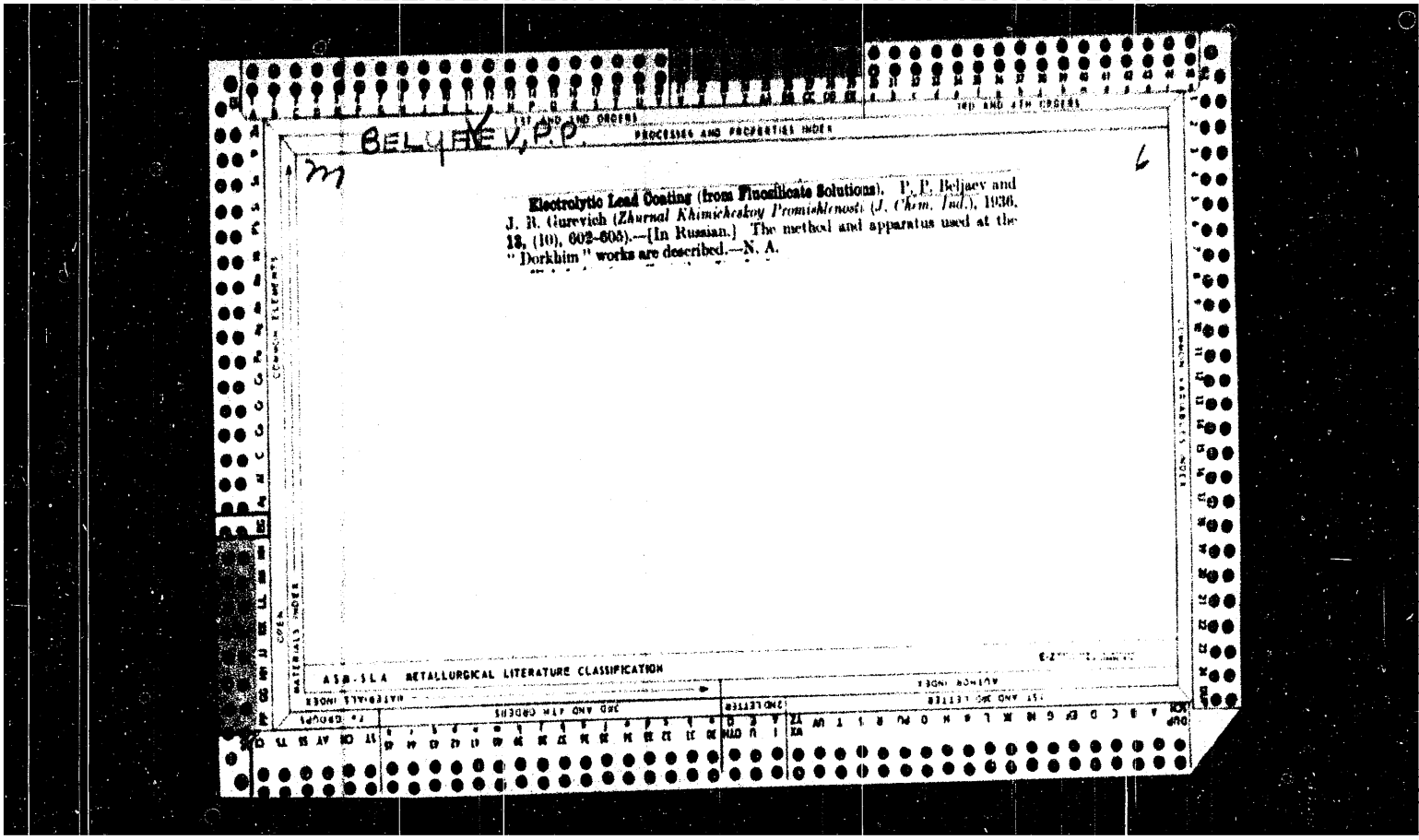


BELAYEV, P.P.
BC

B-I-C

Electrolytic lead plating. P. P. BELAEV and J. B. GUREVITSCH (J. Chem. Ind. Russ., 1936, 13, 602–605). —A Pb coating 1 mm. thick is deposited electrolytically on Fe surfaces (90 hr. at > 40°, with a c.d. of 0·3 – 1·0 amp./sq. dm.; Pb anode), in an electrolyte containing $PbSiF_6$ 135, H_2SiF_6 30, H_3BO_3 5, and glue 1 g. per litre.
R. T.

A53-SLA METALLURGICAL LITERATURE CLASSIFICATION



BELYAEV, P.P.

6

Electrolytic Lead Coating (from Fluosilicate Solutions). P. P. Beljaev and J. R. Gurevich (*Zhurnal Khimicheskoy Promishlennosti* (*J. Chem. Ind.*), 1936, **13**, (10), 602–605).—[In Russian.] The method and apparatus used at the "Dorkhim" works are described.—N. A.

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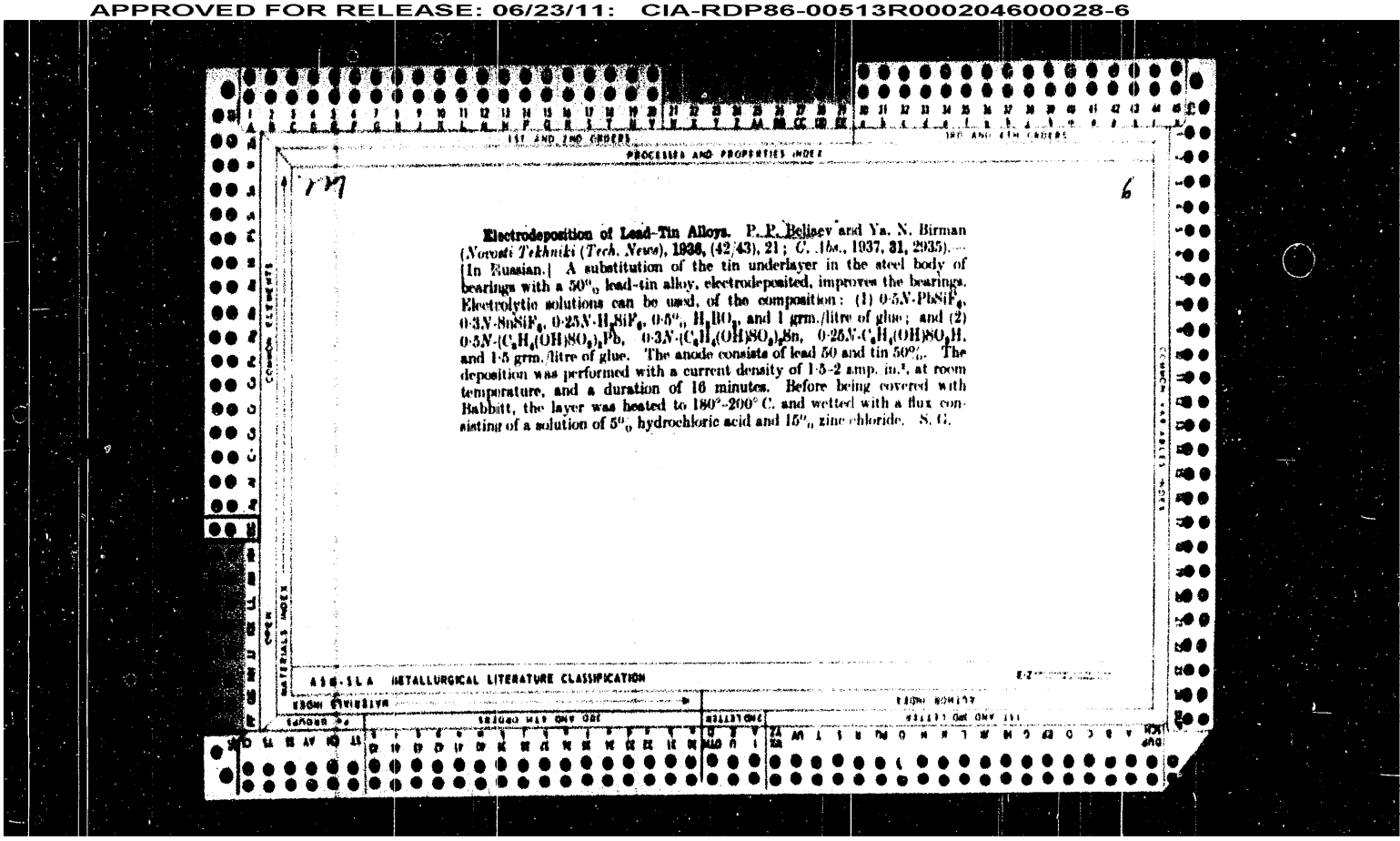
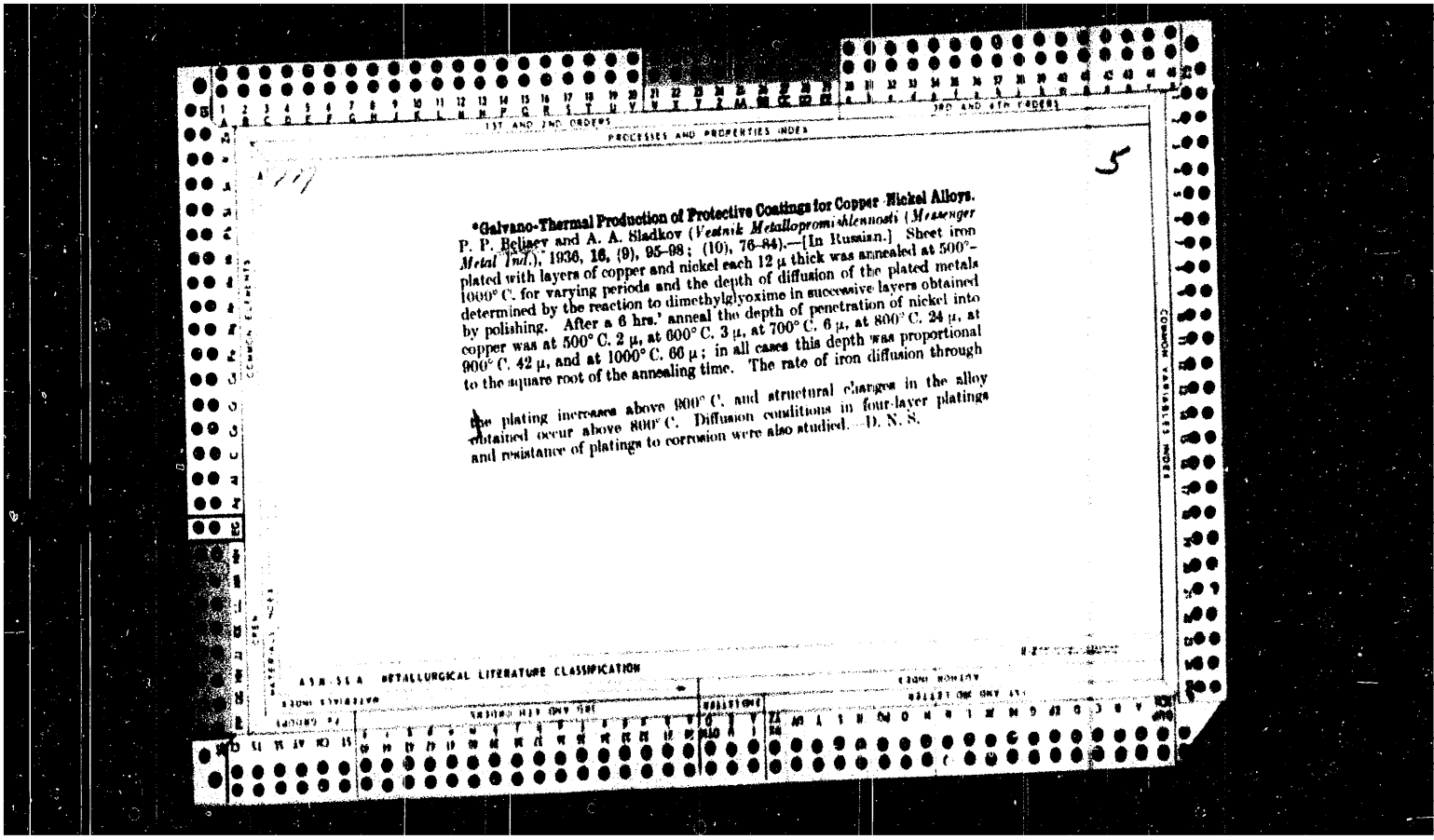


PROCESSES AND PROPERTIES INDEX

6

Electrodeposition of Lead-Tin Alloys. P. P. Belisev and Ya. N. Birman (*Novosti Tekhniki* (*Tech. News*), **1936**, (42/43), 21; *C. Abs.*, 1937, **31**, 2935).—[In Russian.] A substitution of the tin underlayer in the steel body of bearings with a 50% lead-tin alloy, electrodeposited, improves the bearings. Electrolytic solutions can be used, of the composition: (1) 0·5*N*-$PbSiF_6$, 0·3*N*-$SnSiF_6$, 0·25*N*-H_2SiF_6, 0·5% H_3BO_3, and 1 grm./litre of glue; and (2) 0·5*N*-$(C_6H_4(OH)SO_3)_2Pb$, 0·3*N*-$(C_6H_4(OH)SO_3)_2Sn$, 0·25*N*-$C_6H_4(OH)SO_3H$, and 1·5 grm./litre of glue. The anode consists of lead 50 and tin 50%. The deposition was performed with a current density of 1·5–2 amp. in.$^{-2}$, at room temperature, and a duration of 16 minutes. Before being covered with Babbitt, the layer was heated to 180°–200° C. and wetted with a flux consisting of a solution of 5% hydrochloric acid and 15% zinc chloride. S. G.

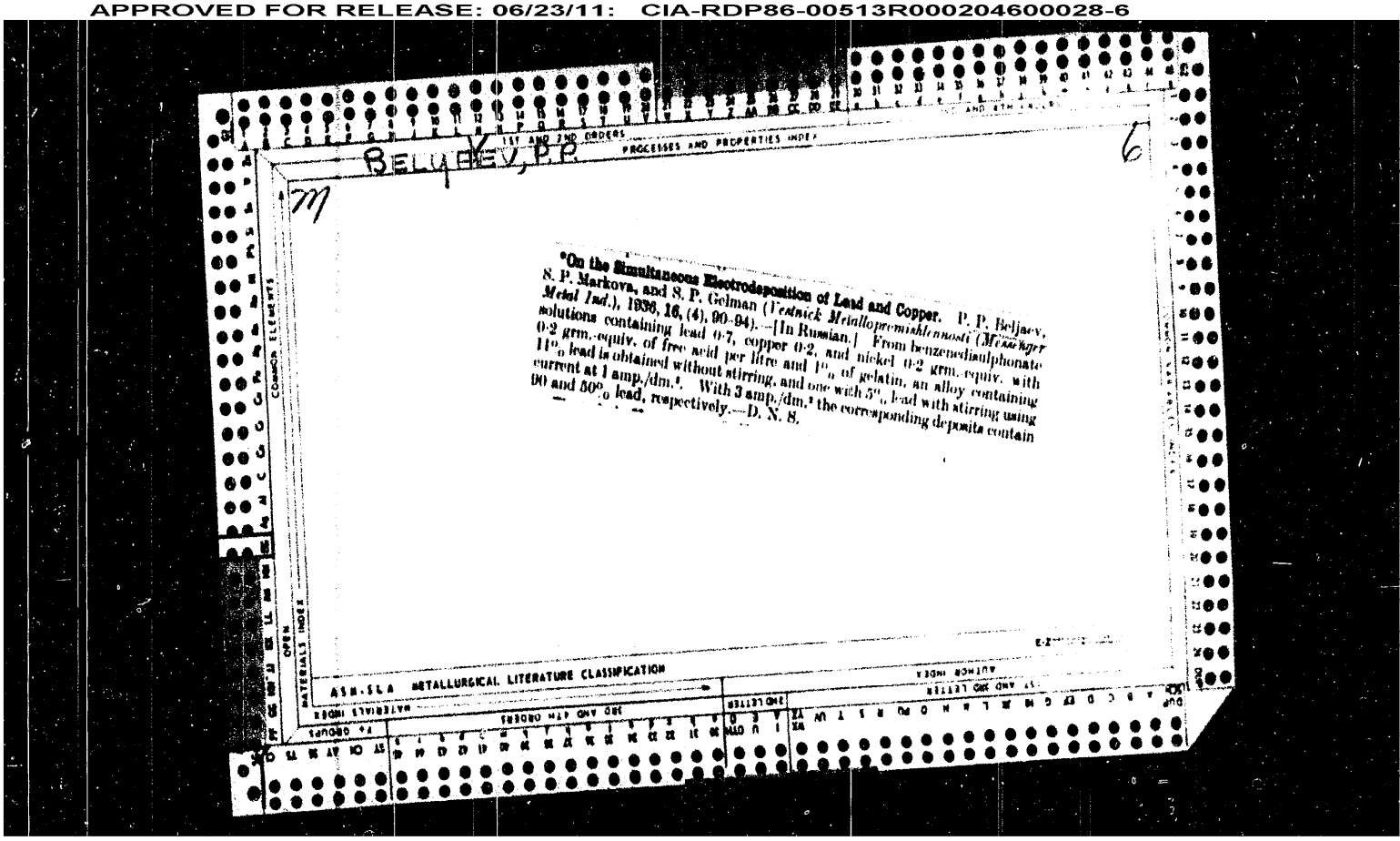
A56-SLA METALLURGICAL LITERATURE CLASSIFICATION



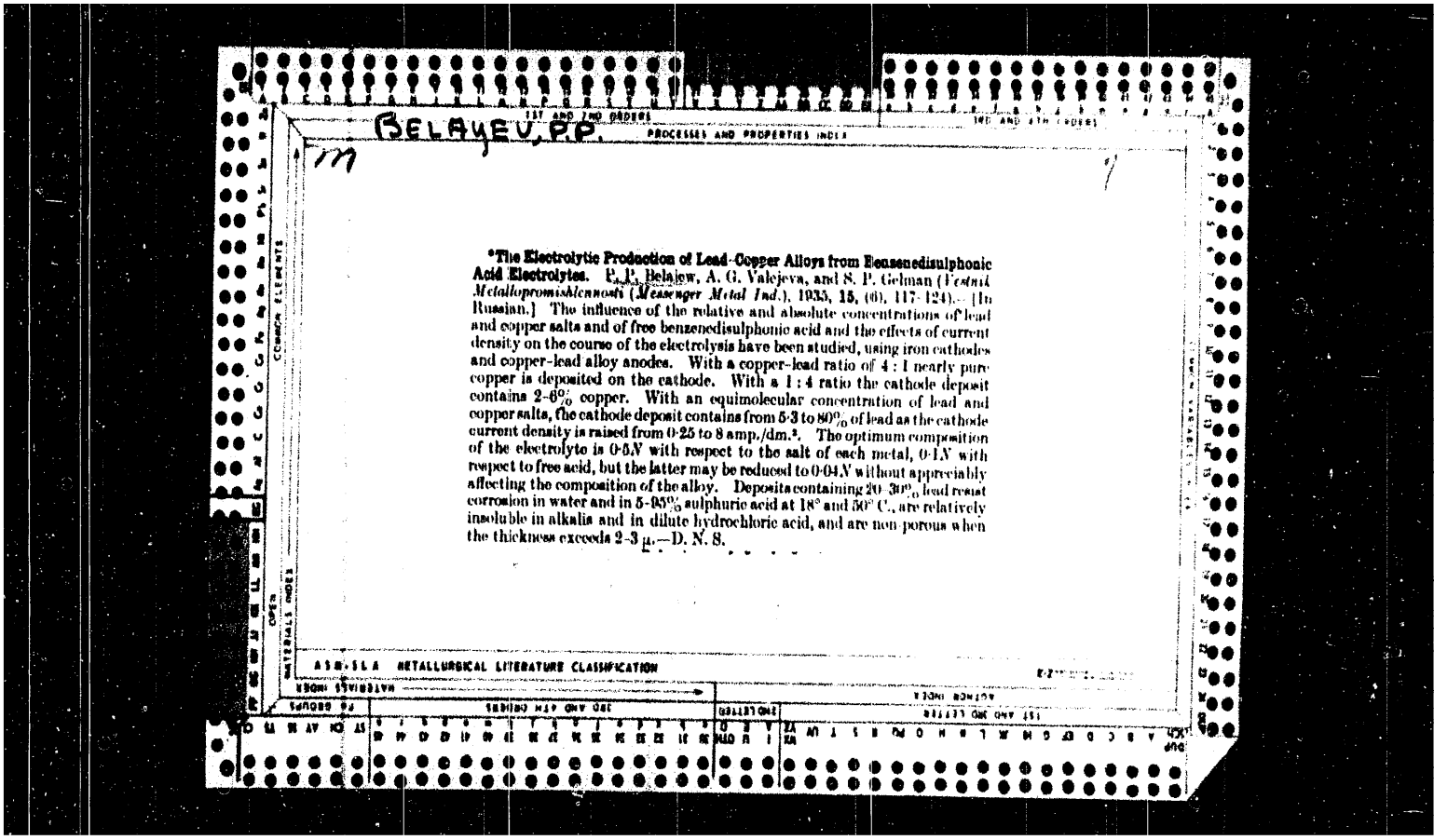
PROCESSES AND PROPERTIES INDEX

***Galvano-Thermal Production of Protective Coatings for Copper-Nickel Alloys.** P. P. Beliaev and A. A. Sladkov (*Vestnik Metallopromishlennosti* (*Messenger Metal Ind.*), 1936, **16**, (9), 95–98; (10), 76–84).—[In Russian.] Sheet iron plated with layers of copper and nickel each 12 μ thick was annealed at 500°–1000° C. for varying periods and the depth of diffusion of the plated metals determined by the reaction to dimethylglyoxime in successive layers obtained by polishing. After a 6 hrs.' anneal the depth of penetration of nickel into copper was at 500° C. 2 μ, at 600° C. 3 μ, at 700° C. 6 μ, at 800° C. 24 μ, at 900° C. 42 μ, and at 1000° C. 66 μ; in all cases this depth was proportional to the square root of the annealing time. The rate of iron diffusion through the plating increases above 900° C. and structural changes in the alloy obtained occur above 800° C. Diffusion conditions in four-layer platings and resistance of platings to corrosion were also studied.—D. N. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

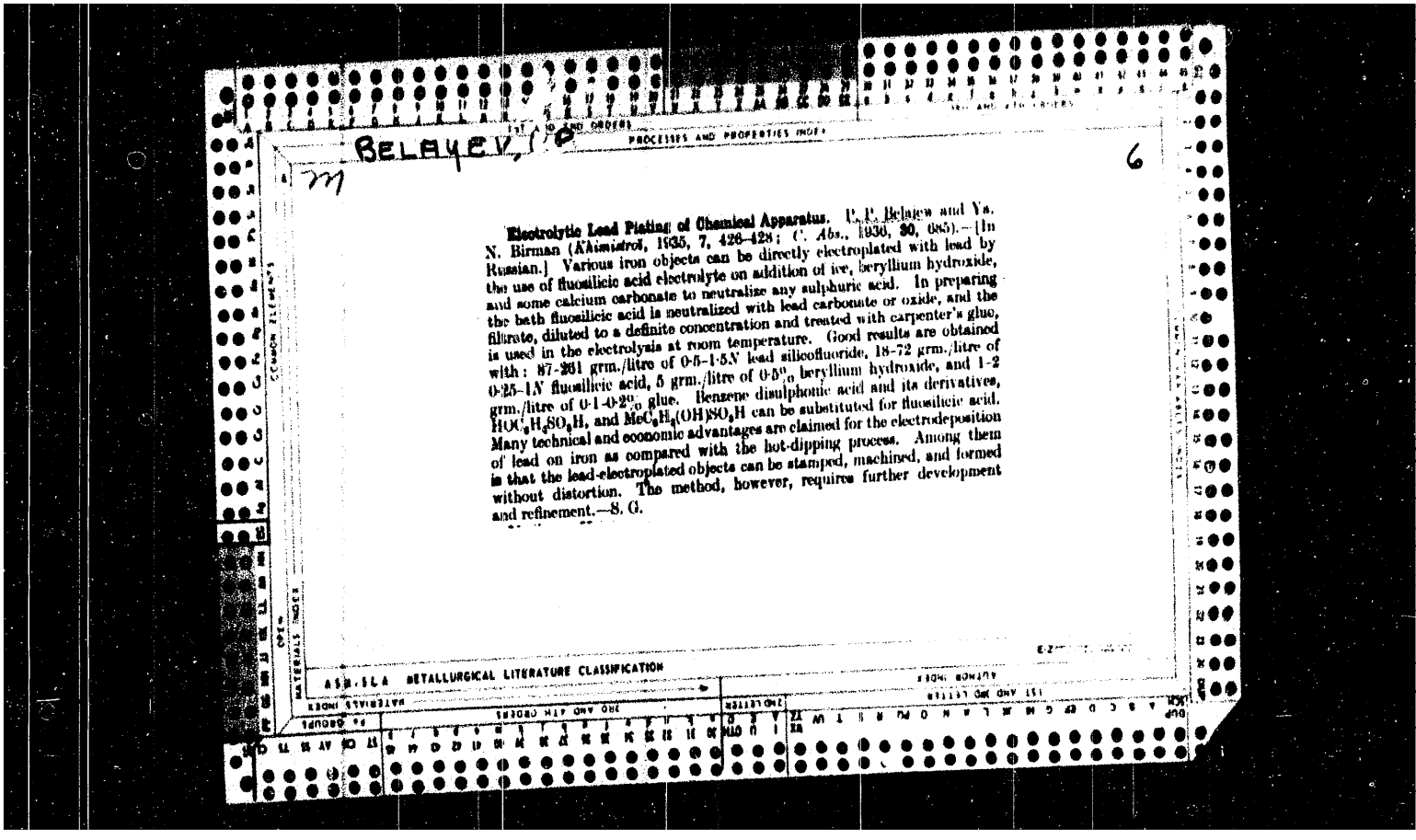


On the Simultaneous Electrodeposition of Lead and Copper. P. P. Beljaev, S. P. Markova, and S. P. Gelman (*Trudy Metallopromishlennosti* (*Moscow Metal Ind.*), 1936, **16**, (4), 90–94).—[In Russian.] From benzenedisulphonate solutions containing lead 0·7, copper 0·2, and nickel 0·2 grm.-equiv. with 0·2 grm.-equiv. of free acid per litre and 1% of gelatin, an alloy containing 11% lead is obtained without stirring, and one with 5% lead with stirring using current at 1 amp./dm.². With 3 amp./dm.² the corresponding deposits contain 90 and 50% lead, respectively.—D. N. S.



BELAYEV, P.P.

***The Electrolytic Production of Lead–Copper Alloys from Benzenedisulphonic Acid Electrolytes.** P. P. Belajew, A. G. Valejeva, and S. P. Gelman (*Vestnik Metallopromishlennosti* (*Messenger Metal Ind.*), 1935, **15**, (6), 117–124).—[In Russian.] The influence of the relative and absolute concentrations of lead and copper salts and of free benzenedisulphonic acid and the effects of current density on the course of the electrolysis have been studied, using iron cathodes and copper-lead alloy anodes. With a copper-lead ratio of 4 : 1 nearly pure copper is deposited on the cathode. With a 1 : 4 ratio the cathode deposit contains 2–6% copper. With an equimolecular concentration of lead and copper salts, the cathode deposit contains from 5·3 to 80% of lead as the cathode current density is raised from 0·25 to 8 amp./dm.^{2}. The optimum composition of the electrolyte is 0·5*N* with respect to the salt of each metal, 0·1*N* with respect to free acid, but the latter may be reduced to 0·04*N* without appreciably affecting the composition of the alloy. Deposits containing 20–30% lead resist corrosion in water and in 5–35% sulphuric acid at 18° and 50° C., are relatively insoluble in alkalis and in dilute hydrochloric acid, and are non-porous when the thickness exceeds 2–3 μ.—D. N. S.



BELAYEV, I.P.

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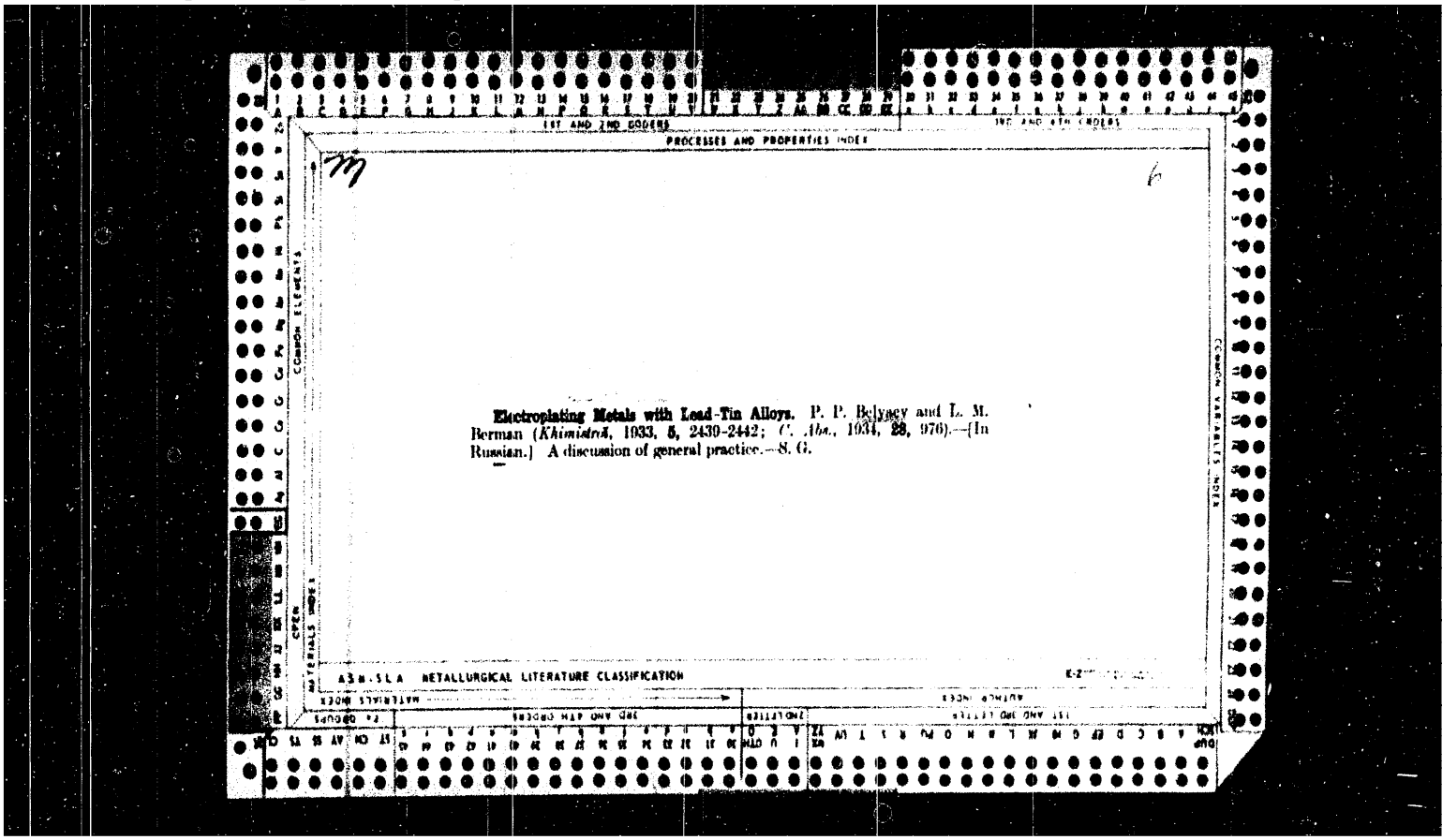
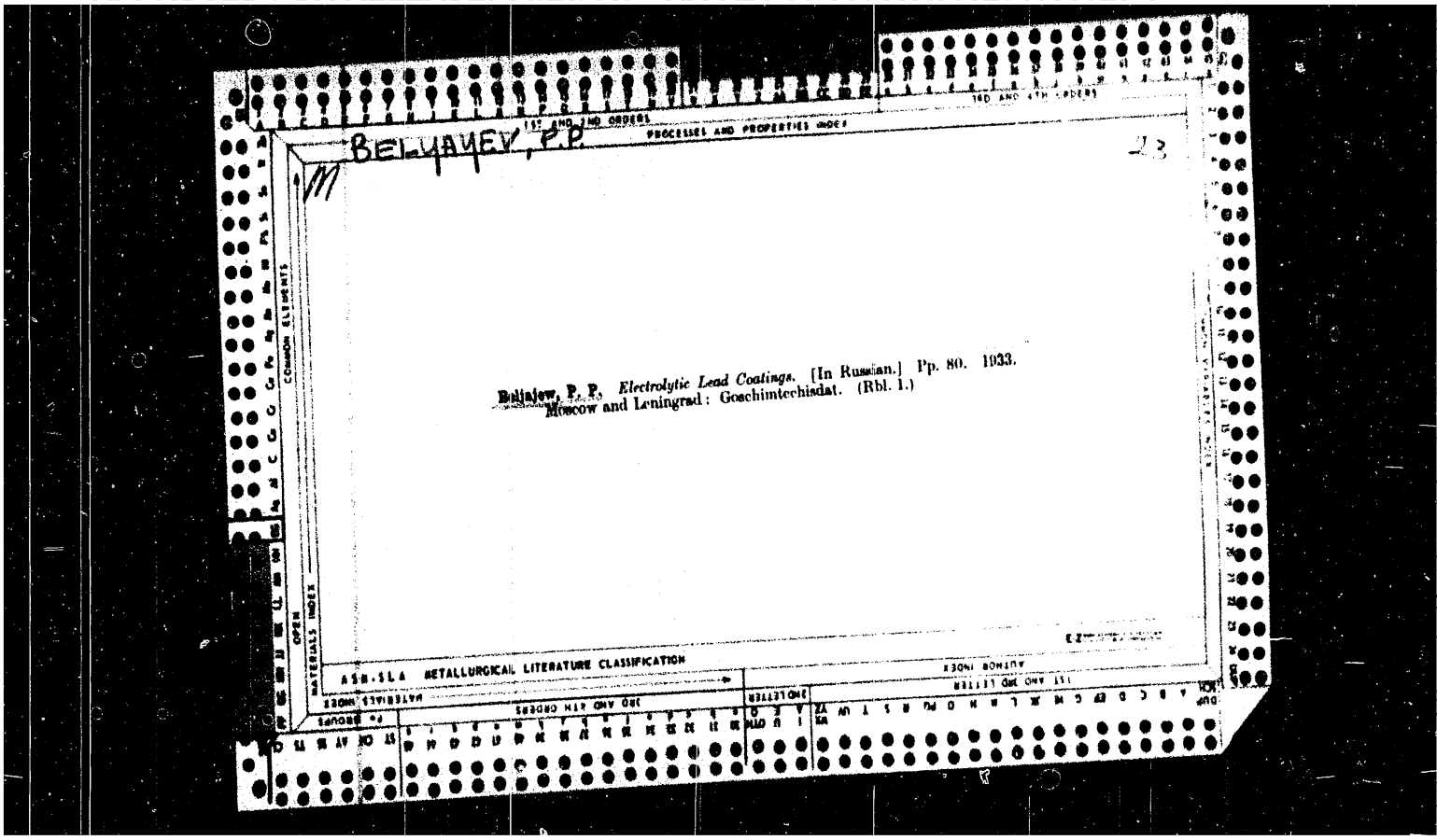
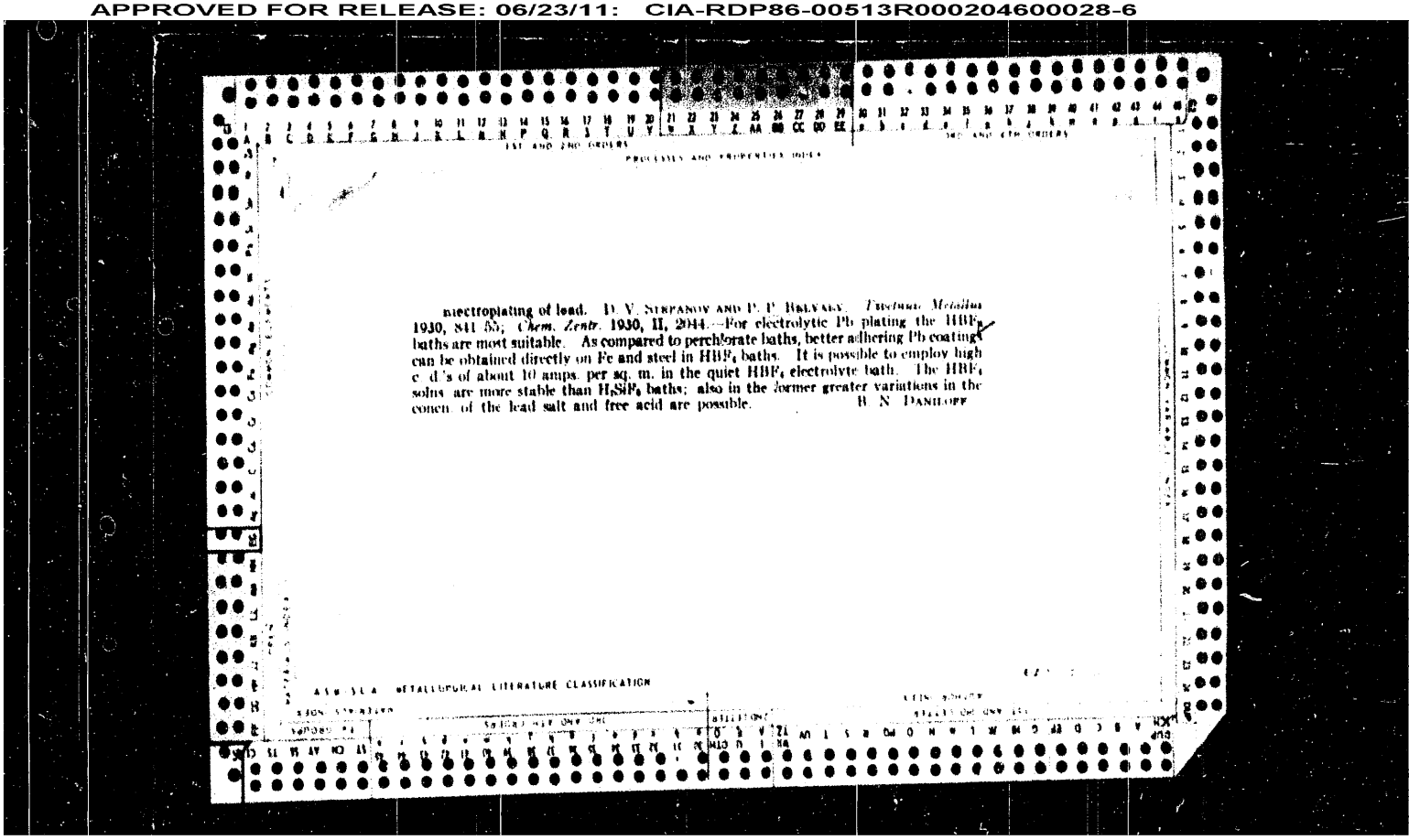
Electrolytic Lead Plating of Chemical Apparatus. I. P. Belayev and Ya. N. Birman (*Khimstroi*, 1935, **7**, 426–428; *C. Abs.*, 1936, **30**, 685).—[In Russian.] Various iron objects can be directly electroplated with lead by the use of fluosilicic acid electrolyte on addition of ice, beryllium hydroxide, and some calcium carbonate to neutralise any sulphuric acid. In preparing the bath fluosilicic acid is neutralized with lead carbonate or oxide, and the filtrate, diluted to a definite concentration and treated with carpenter's glue, is used in the electrolysis at room temperature. Good results are obtained with: 87–261 grm./litre of 0·5–1·5*N* lead silicofluoride, 18–72 grm./litre of 0·25–1*N* fluosilicic acid, 5 grm./litre of 0·5% beryllium hydroxide, and 1–2 grm./litre of 0·1–0·2% glue. Benzene disulphonic acid and its derivatives, $HOC_6H_3SO_3H$, and $MeC_6H_3(OH)SO_3H$ can be substituted for fluosilicic acid. Many technical and economic advantages are claimed for the electrodeposition of lead on iron as compared with the hot-dipping process. Among them is that the lead-electroplated objects can be stamped, machined, and formed without distortion. The method, however, requires further development and refinement.—S. G.



Electroplating Metals with Lead-Tin Alloys. P. P. Belyaev and L. M. Berman (*Khimstroi*, 1933, **5**, 2439-2442; *C. Abs.*, 1934, **28**, 976).—[In Russian.] A discussion of general practice.—S. G.





electroplating of lead. D. V. STEPANOV AND P. P. BELYAEV. *Tsvetnye Metally* 1930, 841-55; *Chem. Zentr.* 1930, II, 2044.—For electrolytic Pb plating the HBF_4 baths are most suitable. As compared to perchlorate baths, better adhering Pb coatings can be obtained directly on Fe and steel in HBF_4 baths. It is possible to employ high c. d.'s of about 10 amps. per sq. m. in the quiet HBF_4 electrolyte bath. The HBF_4 solns. are more stable than H_2SiF_6 baths; also in the former greater variations in the concn. of the lead salt and free acid are possible. B. N. DANILOFF

BELYAYEV, P.N.

Investigating the deformation of links of the basic regulator. Izv. vys. ucheb. zav.; tekh. tekst. prom. no.2:82-88 '65. (MIRA 18:5)

1. Ivanovskiy tekstil'nyy institut imeni Frunze.

BELYAYEV, P.N.; SAKHAROV, V.D.

Effect of the form of the shed on warp tension and breakage. Izv.vys. ucheb.zav.; tekh.tekst.prom. no.5:56-60 '64.

(MIRA 18:1)

1. Ivanovskiy tekstil'nyy institut imeni M.V.Frunze.

BELYAYEV, P.M.

Effect of general Co^{60} irradiation on the ribonucleic and desoxyribonucleic acid content in the wall of the small intestine of animals. Med.rad. no.9:34-38 '61. (MIRA 15:1)

1. Iz kafedry biokhimii Minskogo meditsinskogo instituta.
(INTESTINES—RADIOGRAPHY) (COBALT—ISOTOPES)
(NUCLEIC ACIDS)

BELYAYEV, P.M.

Dependence of nucleic acid content of the liver and spleen in guinea pigs on the amount of their ascorbic acid requirement in thermal burns. Vop. pit. 19 no.3:37-42 My-Je '60. (MIRA 14:3)

1. Iz kafedry biokhimii (zav. - prof. M.F.Merezhinskiy) Minskogo meditsinskogo instituta.

(BURNS AND SCALDS) (ASCORBIC ACID)
(NUCLEIC ACIDS) (LIVER) (SPLEEN)

BELYAYEV, P.M.

"Effect of Thermal Burn on Content of Nucleic Acid in the Liver," by P. M. Belyayev, Sbornik Nauchnykh Rabot Minskogo Meditsinskogo Instituta (Collection of Scientific Works of Minsk Medical Institute) Vol 16, 1956, pp 53-61 (from Referatinvyy Zhurnal -- Khimiya, Biologicheskaya Khimiya, No 2, 25 Jan 57, p 77, Abstract No 1772)

In guinea pigs subjected to experimental thermal burns covering 15-20% of the body surface, the content of desoxyribonucleic acid decreased 27.7% and the content of ribonucleic acid increased 4.8% in comparison with the control. At the end of 3 days the content of DNA decreased 40% but RNA increased 6.3% of the normal. Only on the 5th day after the burn a change was observed toward normalization of nucleic acid metabolism; there was a sharp increase in the amount of DNA and a slight drop in RNA in comparison with the preceding period, but their content did not return to normal. (U)

Sum. 1360

BELYAYEV, P.M.

Liver nucleic acid content in case of thermal burns of the skin. [with summary in English]. Vop.med.khim. 2 no.5:359-362 S-O '56.

1. Kafedra biokhimii Minskogo meditsinskogo instituta.
(BURNS, metabolism in,
liver nucleic acid in guinea pigs (Rus))
(LIVER, metabolism,
nucleic acid in exper. burns in guinea pigs (Rus))
(NUCLEIC ACIDS, metabolism,
liver, inexper. burns in guinea pigs (Rus))

BELYAEV, P.M.

Effect of protein starvation on the content of nucleic acids in the liver, small intestine, and spleen. Voprosy Pitaniya 12, No.1, 13-23 '53. (CA 47 no.14:7049 '53) (MLRA 6:3)

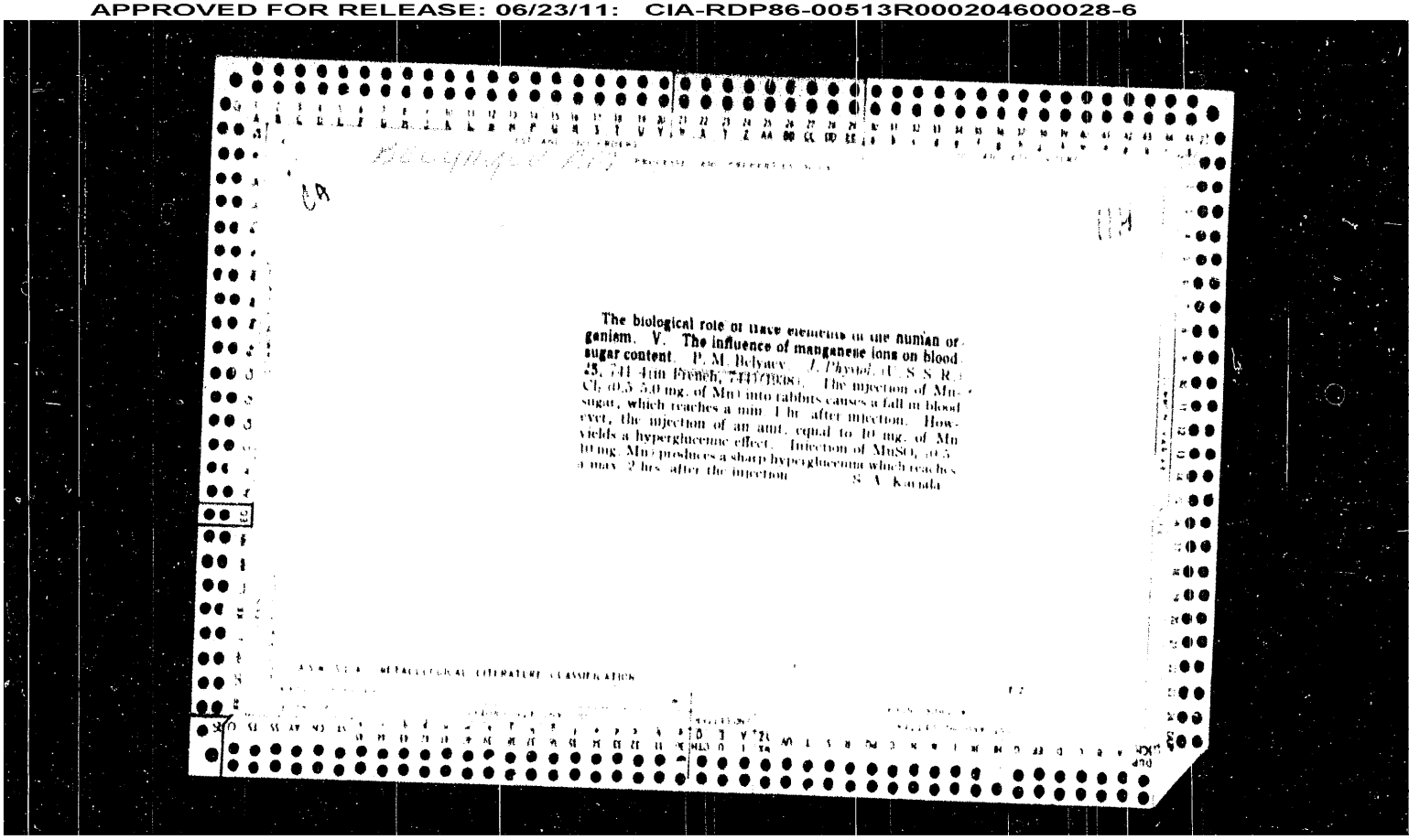
1. Med. Inst., Minsk.

~~BELYAEV P. M.~~
BELYAYEV, P.M.

4540. BELYAEV P.M. Med. Inst., Minsk. * Effect of protein starvation on the content of nucleic acids in the liver, small intestine, and spleen (Russian text) VOPROSY PITANIYA 1953, 12/1 (13-23)

Experiments with white rats on a diet that was almost totally protein-free resulted in disturbance of nucleic acid distribution in their bodies. The change was most pronounced in the spleen. RNA declined in the spleen, small intestine, and the liver over a 35-day period. After 60 days RNA content began to rise and actually exceeded the normal levels in the small intestine and liver. During protein starvation DNA, however, continued to rise over the 60-day period in the liver and the small intestine; in the spleen it declines over 35 days then rose almost to normal over the 60-day period. If the animals are transferred to normal diet after the 60-day experimental period, there occurs a return to normal levels of nucleic acids within 15 days in the liver and the intestine, but the changes in the spleen appear to be irreversible, since a decline (from normal) of nucleic acids occurs. Kosolapoff (Chem. Abstr.)

SO: Excerpta Medica, Section II, Vol 7, No 9



The biological role of trace elements in the human organism. V. The influence of manganese ions on blood sugar content. P. M. Belyaev. *J. Physiol. U.S.S.R.* 25, 741-4 (in French, 744) (1938). The injection of $MnCl_2$ (0.5-5.0 mg. of Mn) into rabbits causes a fall in blood sugar, which reaches a min. 1 hr. after injection. However, the injection of an amt. equal to 10 mg. of Mn yields a hyperglucemic effect. Injection of $MnSO_4$ (0.5-10 mg. Mn) produces a sharp hyperglucemia which reaches a max. 2 hrs. after the injection. S. V. Kaznda